

ARKANSAS RIVER, ARK. AND OKLA.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING,

WITH A LETTER FROM THE CHIEF OF ENGINEERS, REPORT ON
REEXAMINATION OF ARKANSAS RIVER, ARK. AND OKLA.

JANUARY 4, 1916.—Referred to the Committee on Rivers and Harbors and
ordered to be printed.

WAR DEPARTMENT,
Washington, December 17, 1915.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

SIR: I have the honor to transmit herewith a letter from the Chief of Engineers, United States Army, of this date, together with copy of a report from Maj. A. B. Putnam, Corps of Engineers, dated March 24, 1915, on reexamination of Arkansas River, Ark. and Okla., made by him in compliance with the provisions of the river and harbor act approved March 4, 1915.

Very respectfully,

LINDLEY M. GARRISON,
Secretary of War.

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, December 17, 1915.

From: The Chief of Engineers, United States Army.

To: The Secretary of War.

Subject: Reexamination of Arkansas River, Ark. and Okla.

1. There is submitted herewith for transmission to Congress report dated March 24, 1915, by Maj. A. B. Putnam, Corps of Engineers, on reexamination of the project for improvement of Arkansas

River, Ark. and Okla., directed by section 14 of the river and harbor act of March 4, 1915.

2. The Arkansas River has been under improvement by the United States since 1832, when snagging operations were inaugurated. The present project provides for improving the river from its mouth to the head of navigation by snagging operations, removing shoals by dredging and the use of contraction works, and holding the improved channel by revetment where necessary; the tentative use of two dredges on that part of the river between the mouth and Ozark, 318 miles; and the maintenance of existing works, including those at Pine Bluff, Ark. It was not expected that the operation of the two suction dredges between the mouth and Ozark would be able to maintain a navigable channel throughout that section, but these dredges were recommended for use in an experimental way to determine the practicability of improving the river by this method and at the same time to aid and encourage navigation. Experience has now demonstrated that no benefit commensurate with the cost can be expected from them, even if confined to the short reach below Pine Bluff, where they have been operated. The commerce has been decreasing and now amounts to only about 55,000 tons, a large part of which consists of forest products, which can usually be handled at medium and high stages without improvement. In view of the existing physical and commercial conditions the district officer thinks that the work of revetting the banks should be revived, and he recommends that the project be modified to provide for "the improvement of the river from its mouth to the mouth of Grand [Neosho] River (461 miles) by snagging operations, by revetting of banks, and by dredging operations with a view to producing at ordinary low water channel depths of $3\frac{1}{2}$ feet to Little Rock, 3 feet from there to Ozark, $2\frac{1}{2}$ feet from there to the mouth of the Canadian River, and 2 feet from there to the mouth of Neosho River." The division engineer calls attention to the general decline of commerce on the western rivers, and recommends that for the present all work of improvement on this river be confined to snagging, which work alone is justified by existing commerce.

3. This report has been referred, as required by law, to the Board of Engineers for Rivers and Harbors, and attention is invited to its report herewith, dated December 8, 1915. It lays special stress upon the small low water discharge of this river which prevents the formation of a channel giving commercial benefits commensurate with the cost of any radical improvement. The board concurs in the recommendation of the division engineer.

4. After due consideration of the above-mentioned reports, I concur in the views of the division engineer and the Board of Engineers for Rivers and Harbors, and therefore recommend that legislation be enacted modifying the existing project for improvement of Arkansas River, so as to limit the work to snagging the river from its mouth to the mouth of the Neosho, at an annual cost of about \$35,000, and authorizing the transfer without charge of the dredges and other plant not required for snagging to such other works of improvement as the Chief of Engineers may designate.

DAN C. KINGMAN,
Chief of Engineers, United States Army.

REPORT OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS.

[Third indorsement.]

BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
December 8, 1915.

The CHIEF OF ENGINEERS, UNITED STATES ARMY.

1. The following is in review of the district officer's report submitted under authority of section 14 of the river and harbor act of March 4, 1915, on reexamination of "Arkansas River, Ark. and Okla.," with a view of determining whether the adopted project shall be modified or the improvement abandoned.

2. The district officer reviews the history of the improvements which have been carried on from time to time under various projects since the inception of the work in 1832, when snagging was undertaken. Since that time much study by boards of engineers and by district officers has been given to the question of improving the river, and various methods have been tried involving snagging, dredging, bank protection, and contraction works.

3. The existing project provides for improvement from the mouth to Ozark, 318 miles, by the operation of two suction dredges; from the mouth to the head of navigation by snagging, dredging, and contraction works, holding the improved channel by revetment where necessary; and maintenance of works at Pine Bluff. No estimate of cost has been given. Under this and the various other projects described by the district officer, there had been expended to June 30, 1914, a total of \$3,243,650.91. It is estimated that snagging will cost \$35,000 annually and that it will require \$118,700 annually for the operation of the two dredges.

4. It will be seen from a study of the history of this stream that little has been accomplished in the way of permanent improvement. The experimental operation of the dredges has demonstrated that only temporary benefit can be expected from them, even if confined to the short reach below Pine Bluff, and that several more dredges would be required on the reach now under improvement to secure anything like reliable navigation. Bank revetment and contraction works are of little benefit unless made practically continuous, and this would involve a much larger expenditure than would be justified by probable resulting advantages.

5. The commerce has been decreasing and now amounts to only about 55,000 tons, a large part of which consists of forest products, which can usually be handled at medium and high stages without improvement. Gradually the large vessels which formerly navigated this river have disappeared and the little business that is now done is by a few small boats operating over short distances.

6. The district officer believes that the improvement of the river should not be abandoned, but that more complete work of regulation should be undertaken and the project modified to read:

The improvement of the river from its mouth to the mouth of Grand (Neosho) River (461 miles) by snagging operations, by revetting of banks, and by dredging operations, with a view to producing at ordinary low water channel depths of $3\frac{1}{2}$ feet to Little Rock, 3 feet from there to Ozark, $2\frac{1}{2}$ feet from there to the mouth of the Canadian River, and 2 feet from there to the mouth of Neosho River.

The division engineer calls attention to the general decline of commerce on the western rivers, including the trunk streams, and recommends that, for the present, all improvement on the Arkansas be confined to snagging, which is warranted by the existing commerce. He believes that dredging would be a waste of public funds.

7. As a result of notice to interested parties that abandonment of the project was under consideration, a request was made to the board for a public hearing. On account of the importance of the questions involved, this was given at Little Rock on November 16, 1915. A large number of persons were in attendance, including delegations from the principal cities above and below Little Rock.

8. On November 12 to 15 the board made a personal inspection of the lower 90 miles of the river, and on the latter date visited the bauxite mines situated about 22 miles from Little Rock. These mines have now an output of about 200,000 tons a year, which is shipped to East St. Louis. During the past year about 12,000 tons of this were handled by water, after rail shipment to Devall Bluff on the White River. Representatives of the bauxite corporation stated that it was their intention to establish a modern towboat and barge line between East St. Louis and some point on the Arkansas, White, or Mississippi Rivers to handle the aluminum ore, and on account of the shorter rail haul they would use the Arkansas River if it were effectively improved. The distances by rail from the bauxite mines to Little Rock on the Arkansas, Devall Bluff on the White, and Helena on the Mississippi, are 22, 69, and 134 miles, respectively. The corresponding water hauls to East St. Louis are 764, 722, and 496 miles, respectively. There is ample depth in the Mississippi, and there is also a greater depth now in the White River than can be obtained in the Arkansas River by open-river methods of improvement.

9. The Arkansas River flows through an alluvial bed, and the channel is subject to unusually rapid changes in position and depth. Its banks are easily eroded, and experience has shown that no permanent improvement of channel can be expected unless the banks are protected by revetment. This would necessitate practically continuous work on one or both banks, similar in character to that being done on the Missouri River under the existing project for that stream. Such work on the Missouri River costs from \$50,000 to \$60,000 per mile, and is expected to result in a channel depth of 6 feet or more. The permanent improvement of the Arkansas would be correspondingly expensive, and owing to the small low water discharge could hardly be expected to result in a low-water channel depth of more than about 3 feet, which would obviously be inadequate for a commerce great enough to justify such an expenditure.

10. The difficulty and great cost of permanently improving the Arkansas River led to the trial of the dredging project, as the commercial interests were considered of sufficient importance to justify the experiment in order to determine its utility on this stream and in the hope of receiving at least some temporary benefit and encouragement to navigation. The results attained are comparable to those secured by dredging on other streams when measured by length of channel dug in a given working time. They show that the two dredges in service, at an annual cost of \$118,700 for operation,

can not under ordinary conditions secure an improved channel even to Pine Bluff, and much less to Little Rock. The dredged channel fills rapidly with the sudden and uncertain changes in stage, and even if the number of dredges were increased at a correspondingly increase in cost, the results would still fall short of a dependable and satisfactory channel.

11. The board fully realizes the advantages of water transportation and the benefits that would result to a large section of the States of Arkansas and Oklahoma if a stable channel of good navigable depth were available. The physical conditions on this stream, however, and particularly its small low-water discharge, are such as to prevent any radical improvement except at a cost which is entirely disproportionate to resulting benefits, as far as they can now be foreseen. The removal of snags, at an estimated cost of \$35,000 per year, will make the natural depths available and permit a light-draft navigation, such as has been carried on in the past. It is believed that this work should be continued.

12. In view of the foregoing, the board recommends legislation modifying the existing project so as to limit the work to snagging the river from its mouth to the Neesho. at an annual cost of about \$35,000, and authorizing the transfer without charge of the dredges and other plant not required for snagging to such other improvement as the Chief of Engineers may designate.

For the board:

W. M. BLACK,
*Colonel, Corps of Engineers,
Senior Member of the Board.*

REEXAMINATION OF ARKANSAS RIVER, ARK. AND OKLA.

WAR DEPARTMENT,
UNITED STATES ENGINEER OFFICE,
Little Rock, Ark., March 24, 1915.

From: The District Engineer Officer.

To: The Chief of Engineers, United States Army
(Through the Division Engineer).

Subject: Reexamination of project, Arkansas River, Ark. and Okla.,
directed by river and harbor act of March 4, 1915.

1. The following preliminary report upon a reexamination of the project for the improvement of Arkansas River, Ark. and Okla., is made, in compliance with instructions contained in your letter of the 18th instant.

2. This reexamination is ordered by the river and harbor act of March 4, 1915. The wording of the portion of the act applying to it is:

SEC. 14. That the following projects now under improvement shall be re-examined, in accordance with the law for the original examination of rivers and harbors, with a view to obtaining reports whether the adopted projects shall be modified or the improvement abandoned:

*	*	*	*	*	*	*
Arkansas River, Arkansas and Oklahoma.						
*	*	*	*	*	*	*

3. The adopted phraseology for expressing the existing project for the improvement of the Arkansas River is:

The improvement of the Arkansas River from its mouth to Ozark (318 miles) by operating two suction dredges; from its mouth to the head of navigation by snagging operations, by dredging operations, and by contraction works, holding the improved channel by revetment where necessary; and maintenance of works at Pine Bluff. No estimate of cost can be given.

4. Omitting many details and references, a brief general statement of the original projects and the changes in them which led to the existing project is: The first work done for the improvement of the Arkansas River was that of removing snags, etc., from the channel, a work inaugurated by act of July 3, 1832. This remained the means for improvement of the stream until by act of August 14, 1876, local improvement in the vicinity of Fort Smith was authorized. The limits for the snagging operations adopted by the act of July 3, 1832, were not stated in the act, but it seems that none were contemplated above Fort Smith, since the act of March 3, 1879, adopted a project for the improvement of the river from Fort Smith to Wichita, Kans., by snagging operations and the construction of slight wing dams at some of the worst shoals. In the following year the act of June 14, 1880, adopted a local project for the improvement of the river in the vicinity of Pine Bluff. Thus there were then four projects for the improvement of the Arkansas River, two local ones, Fort Smith and Pine Bluff, and two for snagging operations, one below Fort Smith, the other above Fort Smith. The first project contemplating permanent improvement of any extended portion of the river was that adopted by act of August 5, 1886, for the improvement of the river between Little Rock and the Mississippi River (174 miles) by means of permanent works to cost \$2,538,544 and to give a channel depth of 6 feet at low water. The snagging operations continued under a separate project. In 1888 a board of engineers made an examination of the river and prepared a project for its improvement from the Mississippi River to the mouth of the Canadian River, 424 miles. The estimated cost of the proposed work was \$16,360,000. The results to be obtained were 4 feet channel depth between the Mississippi River and Little Rock (174 miles) and 3 feet channel depth between Little Rock and Canadian River (250 miles). The project suggested by that board was not adopted, but by act of August 11, 1888, Congress adopted one of much larger scope, the project adopted by that act being:

Improving Arkansas River, Arkansas: Continuing improvement, \$150,000: *Provided*, That nothing herein contained shall authorize the Secretary of War to enter upon project of improvement of said river as set forth in the report of the Board of Engineers on improvement of Arkansas River, from Wichita, Kans., to its mouth, dated New York City, March 16, 1888, and contained in House Executive Document No. 234, Fiftieth Congress, first session: *Provided*, That the Secretary of War shall expend the appropriation under this head with reference to the final improvement of this river as contemplated in the report of the Chief of Engineers for the year ending June 30, 1885, and as authorized in the act for the improvement of rivers and harbors, approved August 5, 1886, and in House Executive Document No. 90, Forty-ninth Congress, first session, said methods to be applied as the Secretary of War may direct at such points between Wichita, Kans., and the navigable mouth of the Arkansas River at its junction with the Mississippi River, as he may deem for the best interests of commerce. And all moneys now to the credit of different sections of the Arkansas River, other than the appropriations for the operating of the snag boats, shall be available for use under this head; and in

the future the engineer in charge of this work and the Secretary of War shall make a report upon the progress and needs of this work under this head instead of reporting upon disconnected projects as heretofore. Nothing herein contained shall be understood to prevent the Secretary of War from applying any part or all funds previously appropriated for use at Fort Smith, Dardanelle, in Pine Bluff Reach, or from expending not exceeding \$8,000 as a contingent fund for expenditure in Pine Bluff Reach.

This project covered 772 miles of river with no estimate of cost being given. The object sought was to obtain 6-foot channel depth below Little Rock, and 2-foot channel depth above that place. The snagging operations remained a separate project. Work under the project of August 11, 1888, was continued until 1898, when the district engineer officer reported that it was his opinion that it was impracticable to obtain the low-water depth of 6 feet below Little Rock as called for by the project. Following this, Congress, in the river and harbor act of March 3, 1899, authorized the President to appoint a board to examine the river and report such plan for its improvement as, in its opinion, was most feasible and which was best adapted to the necessities of commerce. The report of that board is printed in the annual report for 1901, pages 2128-2154. The project was not adopted by Congress, but in the following year, in the river and harbor act of June 13, 1902, the snagging operations were combined with the general improvement, making the one project cover all classes of work. The project was then stated:

The improvement of the river from its mouth to the head of navigation by snagging operations, by dredging operations, and by contraction works, holding the improved channel by revetment where necessary.

Although this project provided for the several classes of work, the general appropriations were reduced to an amount that provided for only a very limited amount of work outside of the snagging operations, until the act of June 25, 1910, made appropriation for the construction and operation of two suction dredges. This authorization arose from a combination of two reports by engineer boards. The first of these reports is a report on the Arkansas River up to Muskogee, printed in House Document 71, Sixty-first Congress, first session; the other is a report on Arkansas River between Little Rock and Ozark, printed in House Document No. 510, Sixty-first Congress, second session. The substance of these reports is that while the river could be improved to give low-water channel depths of about 4½ feet to Little Rock, about 3 feet to Fort Smith, and about 2 feet to the mouth of Grand River by means of permanent works, that the cost would be greater than the General Government would be justified in expending, and that in lieu of any attempt at permanent improvement only such temporary expedients should be used as would meet the urgent demands of commercial interests. While the snagging operations were recognized as necessary, they do not give any increase in channel depths. To give the increase in channel depths the Board of Engineers for Rivers and Harbors recommended the use of two suction dredges between the mouth of the river and Ozark. As Congress adopted the recommendation for the suction dredges, and in the same river and harbor bill authorized the maintenance of the works at Pine Bluff, the project for the improvement of this river then became the present project, as quoted in paragraph 3, but with the

work being done under only three phases of it: First, snagging; second, dredging by two suction dredges; third, maintenance of works at Pine Bluff.

5. The Arkansas being a stream flowing in an unstable bed, no material improvement can be made in it as to channel depths until the banks are made permanent. The several plans and estimates that have been submitted by the several examining boards show that the permanent improvement of the river will be very costly. Dredging in alluvial streams is recognized as being a temporary expedient, and to be of any material benefit to navigation must be carried on on a large enough scale to give relief in a very short time over and throughout the portion of the river used during low-water season, for if one shoal remains to stop navigation the effect of that one shoal is as bad as if a dozen shoals existed at that time. As to the number of dredges that will be required in the Arkansas River, there is a great range in estimates. In the Annual Report of the Chief of Engineers for 1903, page 1410, et seq., there is an estimate made for the operation of dredges between the mouth of the river and Little Rock, 174 miles. Six dredges is stated as being the number needed for that section of the river. The Board of Engineers that made report upon the examination of the river from its mouth to Muskogee, 461 miles (H. Doc. No. 71, 61st Cong., 1st sess.), estimated that 5 dredges would be needed for that section of the river, but no definite statement was made as to how much channel could be actually maintained by them. In the report on the examination of the river from Little Rock to Ozark, 144 miles, a report printed in House Document No. 510, Sixty-first Congress, second session, estimate is made that for maintenance of channel by dredging alone 7 dredges will be necessary in that section, and that even then there will be interrupted navigation. Thus it is seen that while the district engineer officers estimated 13 dredges as the number needed to reasonably maintain the channels between the mouth of the river and Ozark, 318 miles, a board of engineers estimated 5 for the 461 miles between the mouth of the river and Muskogee. The final result was that the Board of Engineers for Rivers and Harbors recommended that 2 dredges be used between the mouth of the river and Ozark. It is not expected that these 2 will be able to maintain a navigation channel at all times throughout that section. The object in operating them is to determine the practicability of improving the river by this method and at the same time aid and encourage navigation.

In the calendar years 1907 and 1908 a 30-inch suction dredge was operated for three months. Its rate of progress in miles of channel dredged was 1.4 miles a month. Beginning with the middle of August, 1914, and ending the 1st of February, 1915, a 24-inch suction dredge was operated between the mouth of the river and Maddings, 91 miles. Maddings is 16 miles below Pine Bluff. In the first 72 miles from the mouth of the river, i. e., mouth to Williamette, there were 2.6 miles of dredging. In the 19 miles between Williamette and Maddings there were 6.1 miles of dredging, making a total of 8.7 miles dredged in $5\frac{1}{2}$ months—a monthly average of 1.6 miles. The 16 miles of river between Maddings and Pine Bluff is practically

the same as the 19 miles between Williamette and Maddings, so far as channel depths and character of channel are concerned. This indicates that had the dredge worked all the way through to Pine Bluff at least 5.1 more miles of dredging would have been needed, thus making 13.8 miles as the total dredging between the mouth of the river and Pine Bluff, or 9 months' work for a single dredge, or $4\frac{1}{2}$ months for the 2 dredges now in the river. The effective channel depth left behind the dredge was $2\frac{1}{2}$ feet at lowest water of the year for a boat 30 feet wide. The volume of flow was about 2,500 cubic feet a second at this time. Ahead of the dredge, i. e., upstream from the dredge, the controlling channel depths were 16 and 18 inches during the period of lowest water. From this statement of work accomplished it is seen that with only 2 dredges little relief can be given to navigation above Pine Bluff.

6. Fort Gibson, on the Neosho (Grand) River, 2 miles from its junction with the Arkansas River and 463 miles from the Mississippi River, is the head of navigation. In the pioneer days it was an important point for river commerce, and boats ran to that point at all times when there was sufficient channel depth in the river. The history of the decline of navigation throughout this river is the same as that on all the other western rivers, i. e., a gradual abandonment of the use of the river as the territory bordering it was supplied with railways. The order of abandonment in this river was—first, the abandonment of the Little Rock-Fort Smith packets, their trade being shortened to Little Rock and Shoal Creek; second, the abandonment of the Little Rock-Memphis packets, this trade being divided in two, Memphis-Pine Bluff, Pine Bluff-Little Rock; third, the abandonment of the Fort Smith-Fort Gibson packets, this being shortened to Fort Smith-Webbers Falls; and, finally, abandonment of all, the only attempt now at permanent packet lines being the Pine Bluff-Rosedale packet and the Pine Bluff-Adamsburg packet. There have been sporadic attempts to revive some of the lines. The last attempt of much importance was that made in 1909, when the Little Rock Packet Co. was organized for the avowed purpose of operating a packet line between Little Rock and Memphis and a combination packet and towboat line between Little Rock and Ozark. The line operated only a short while, and both of its boats have been sold. Just at present there is another attempt being made to revive the Little Rock-Memphis trade, the Little Rock Chamber of Commerce having entered a steamboat in this trade.

7. I have not available an analysis of the freight movement in the Arkansas Valley from which to determine the quantity that would be affected by dependable transportation lines on the Arkansas River. In the report upon the examination of the river between Little Rock and Ozark this was given as 608,000 tons for that 144 miles of river. Of this quantity 400,000 tons was coal. By using this as a basis, the assumption may be made that the total tonnage of freights that would be affected by dependable transportation lines on the Arkansas River from its mouth to Muskogee and Fort Gibson would be 675,000 tons of general freights and 600,000 tons of coal, making a total of 1,275,000 tons. The actual freight movement on

the river during the 10-year period ending with the calendar year 1913 was:

Year.	Short tons.	Value.
1905 (ending May 31).....	86,458	\$1,636,930
1906 (ending May 31).....	103,214	1,512,719
1907 (ending May 31).....	104,593	2,192,531
1908 (ending May 31).....	103,919	2,150,269
1909 (ending May 31).....	92,455	2,122,105
1910 (ending May 31).....	62,172	1,630,338
1910 (calendar year).....	59,516	1,612,288
1911 (calendar year).....	81,371	1,085,018
1912 (calendar year).....	71,516	1,170,990
1913 (calendar year).....	55,228	573,089

In all of these years the heaviest movement has been below Pine Bluff and about 80 per cent of it forest products. The commercial importance of the towns along the river as well as all of those in the entire valley is increasing all the time, although there is no index to this in the volume of traffic on the river.

8. From the time of the initial work on the river in 1832 to the close of the fiscal year ending June 30, 1914, the expenditures for the several classes of work, including all local projects with those of a general nature, have been:

For construction of permanent works.....	\$1,018,511.93
For maintenance of those works.....	514,407.00
For snagging operations.....	1,349,284.67
For procuring and operating suction dredges.....	361,447.31
Total.....	3,243,650.91

9. As to whether the project should be modified or abandoned, I must report that it should not be abandoned. The snagging operations are the one necessity, for without them the natural depths of the stream are not available to navigation. They have to deal only with the continually recurring obstructions that come into the river by reason of caving banks, shifting of channels, and through forest débris brought into the main stream by tributaries during freshets. These operations do not increase channel depths as a rule, nor do they decrease the shifting of the channel. As related to the improvement of a river, they bear the same relations as a street sweeper does to a street, i. e., keep the highway clean. This means continuous operation with no change in physical conditions. These operations should not be abandoned, nor should they be curtailed. The standard estimate is \$35,000 annually. Operation of suction dredges has not yet passed the experimental stage so far as this river is concerned. By "experimental stage" I mean the extent of work required to maintain a navigation channel over any fixed distance of river and the duration of time through which a dredged channel will remain effective.

Of course it is known in a general way that only about 60 per cent of the dredged channels will remain effective during one low-water period, that the first rise of any extent is liable to obliterate all dredged channels, and that the duration of a low stage is liable to many interruptions by small freshets of short duration. It is also known that under favorable conditions a suction dredge will average 1.5 miles of dredged channel 100 feet wide a month, and that the ratio of miles of dredging needed to miles of river to be covered is about as 1 to 25 in the portion of the river below Williamette and

1 to 3 in the portion of the river above Williamette. Williamette is 72 miles from the Mississippi River. These ratios are based on the dredging needed to give a 3.5-foot channel at mean low water. Also in a general way it is known that the two dredges now provided for working this river can not maintain at all times that channel depth below Pine Bluff, 107 miles above the mouth of the river, and that even if their work be confined solely to that section there will be times that navigation will be interrupted by low water. Judging from the public utterances of the commercial bodies at Pine Bluff and Little Rock as to the results that are to be obtained by these two dredges, one must infer that those bodies are of the opinion that continuous navigation channels are to be provided through to Little Rock. When the general public comes to compare the statements issued by the commercial bodies with the actual results of the dredging operations there can not be other than disappointment. The approved estimate for operating these two dredges is \$118,700 a year. I am not prepared to recommend that additional dredges be provided, for since caving banks are the cause of the need for the dredging it would seem that the logical thing to do is to remove the cause, and that dredging should be only a secondary step in the operations instead of the principal one for increasing channel depths.

10. I am not of the opinion that the improvement of the Arkansas River should be abandoned, but am inclined to the belief that the work of revetting the banks should be revived. The commercial importance of the valley is increasing all the time, as is natural under an increase of population. While this increase is not reflected in the river commerce, I can not hold that the absence of such reflection is an indication of the unworthiness of the improvement of the river.

11. In line with the foregoing, I must report that I think the project for the improvement of the river should be modified to read:

The improvement of the river from its mouth to the mouth of Grand River (461 miles) by snagging operation, by revetting of banks, and by dredging operations, with a view to producing at ordinary low water channel depths of $3\frac{1}{2}$ feet to Little Rock, 3 feet from there to Ozark, $2\frac{1}{2}$ feet from there to the mouth of the Canadian River, and 2 feet from there to the mouth of Neosho River.

A. B. PUTNAM,
Major, Corps of Engineers.

[First indorsement.]

OFFICE DIVISION ENGINEER, WESTERN DIVISION,
St. Louis, Mo., May 20, 1915.

To the CHIEF OF ENGINEERS, UNITED STATES ARMY.

1. Forwarded.

2. Not only has the commerce of western rivers rapidly declined in recent years, as stated by the district officer, but the character of the boats carrying the traffic has radically changed. In 1900 the average sized boat that navigated the Arkansas River was one of 174 registered tons, while in 1913 it was only of 46 tons. In 1900 the larger vessels made trips from Little Rock and Pine Bluff to Memphis and Vicksburg, while in 1913 the average distance traveled was only 34 miles, indicating that the boat has entirely ceased competing with the railroad in carrying through traffic and is only used to collect the products of a farm distant from a railroad and transport them to the nearest rail connection. A similar condition is found on all the western rivers, with the exception of the transportation of coal

on the Ohio River and a small movement of freight on the Missouri River between Kansas City and St. Louis. Such transportation has no effect on rail freight rates and can be most profitably carried by motor boats and barges of light draft.

3. Whatever may be the causes of this decline of river traffic, they are of general application to all the western rivers, and the density of traffic on the Arkansas River is so small that there is no probability that the improvement of its channel will counteract this general law, particularly since the radical improvement of the Mississippi River from St. Louis to New Orleans, which has existed for the past 10 years, has had no appreciable effect upon it.

4. Should a revival of river commerce occur, it will first be observed between large centers of population, such as Chicago, Pittsburgh, St. Louis, and New Orleans, where there are large amounts of manufactured articles to be moved. The agricultural products that are directly tributary to a river do not furnish a sufficient volume of freight to justify at present its permanent improvement as a route for through traffic, but a revival of commerce commencing at large centers of population along the trunk stream may gradually extend to the tributaries.

5. It is therefore recommended that the improvement of the Arkansas River be at present confined to snagging, which is warranted by the existing commerce, and that all attempts to permanently improve the river channel be deferred until there is an appreciable revival of commerce on the Mississippi River. The dredging proposed by the district officer is considered a waste of public funds. It can have no effect on the permanent improvement of the river. It is insufficient even to maintain a temporary channel from the river mouth to Pine Bluff. The transfer of the dredges built for the Arkansas River to the Ohio is suggested, where they would be of some practical use.

C. McD. TOWNSEND,
Colonel, Corps of Engineers,
Division Engineer.

[For report of the Board of Engineers for Rivers and Harbors, see p. 3.]

STATEMENT OF TRAFFIC BUREAU OF THE CHAMBER OF COMMERCE, PINE BLUFF, ARK.

Statement showing the present rail rates and the boat rates from river points to Pine Bluff, Ark.

From—	Class rates.							
	First class.		Second class.		Third class.		Fourth class.	
	Rail.	River.	Rail.	River.	Rail.	River.	Rail.	River.
Cincinnati, Ohio.....	\$1.219	\$0.75	\$1.026	\$0.65	\$0.782	\$0.50	\$0.598	\$0.40
Louisville, Ky.....	1.128	.75	.956	.65	.722	.50	.548	.40
St. Louis, Mo.....	1.00	.75	.85	.65	.65	.50	.49	.40
Memphis, Tenn.....	.78	.45	.60	.36	.45	.30	.36	.25

Freight moving from Cincinnati, Louisville, and St. Louis to Pine Bluff is handled by 3 boat lines, and from Memphis by 2 lines.

The above rates have been effective for only 1 year, and it will be noted that they are from 20 to 75 per cent lower than the rail rates.

The estimated saving to the Pine Bluff shippers during the past year on traffic from these points alone is \$4,000, and the movement is doubling every few months.

Statement comparing the class rates from St. Louis, Mo., to Pine Bluff and Little Rock, Ark., with the rates to various other points where the distance is the same or greater.

From—	Miles.	Class rates.										Tariffs.
		1	2	3	4	5	A	B	C	D	E	
		Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	
St. Louis to—												
Pine Bluff and Little Rock, Ark.....	358	100	85	65	49	37	39	32	27	23	18	1
Topeka, Kans.....	345	80	62	49	39	28	32	26	22	18	15	4
Emporia, Kans.....	392	96	74	58	46	37	42	33	26	21	16	4
Lincoln, Nebr.....	491	65	50	39	31	25	27½	22½	20	16½	14	4
St. Paul, Minn.....	576	63	52½	42	26	21	26	21	18	15	13½	5
Duluth, Minn.....	686	78	66	53	34	26	34	26	23	20	19	5
Mobile, Ala.....	866	90	75	65	50	40	.....	.....	.....	.....	.....	5
Pensacola, Fla.....	761	90	75	65	50	40	.....	.....	.....	.....	.....	5
New Orleans, La.....	701	90	75	65	50	40	.....	.....	.....	.....	.....	2
Chicago to—												
St. Paul, Minn.....	442	60	50	40	25	20	25	20	17	14	13	5
Kansas City, Mo.....	451	80	65	45	32	27	32	27	22	18½	16	3
Memphis, Tenn.....	535	85	65	55	43	37	.....	.....	.....	.....	.....	6
Mobile, Ala.....	866	110	90	75	58	47	.....	.....	.....	.....	.....	5
Pensacola, Fla.....	912	110	90	75	58	47	.....	.....	.....	.....	.....	5
Cincinnati to—												
Mobile, Ala.....	784	98	83	73	54	44	.....	.....	.....	.....	.....	5
New Orleans, La.....	923	98	83	73	54	44	.....	.....	.....	.....	.....	5
Pensacola, Fla.....	768	98	83	73	54	44	.....	.....	.....	.....	.....	5
Birmingham, Ala.....	508	89	79	68	55	47	.....	.....	.....	.....	.....	5
Louisville to—												
Montgomery, Ala....	491	98	87	78	62	50	.....	.....	.....	.....	.....	5
Mobile, Ala.....	670	90	75	65	50	40	.....	.....	.....	.....	.....	5
New Orleans, La.....	809	90	75	65	50	40	.....	.....	.....	.....	.....	5
Pensacola, Fla.....	654	90	75	65	50	40	.....	.....	.....	.....	.....	5
New York to—												
Cincinnati, Ohio.....	750	65	57	44	30	26	.....	.....	.....	.....	.....	5
Louisville, Ky.....	850	75	65	50	35	30	.....	.....	.....	.....	.....	5
Evansville, Ind.....	987	83	72	55	39	33	.....	.....	.....	.....	.....	5
Paducah, Ky.....	1,092	90	78	60	42	36	.....	.....	.....	.....	.....	5
Memphis, Tenn.....	1,160	100	85	65	45	38	.....	.....	.....	.....	.....	5
Nashville, Tenn.....	1,047	91	78	60	42	36	.....	.....	.....	.....	.....	5
St. Paul to South Dakota.	360	89	75	59	45	36	36	31	27	22	18	7
Iowa to—												
Kansas and Nebraska	360	86	72	57	43	34	34	30	26	22	17	8
State of Texas.....	360	80	72	60	58	44	46	40	34	23	17	9
State of Oklahoma...	360	85	70	58	50	43	40	33	27	20	16	10
State of Arkansas....	360	82	69	57	45	33	37	28½	24½	20½	16½	11

Tariffs used: 1, F. A. Leland's, S. W. L., I. C. C., 1058; 2, M. P. Washburn's, I. C. C., 119; 3, W. T. L., I. C. C., A602; 4, W. T. L., I. C. C., A494; 5, W. T. L., I. C. C., A422; 6, C. E. Fulton's, I. C. C., A108; 7, I. C. C. Decision 30, I. C. C., 663; 8, I. C. C. Decision 28, I. C. C., 193; 9, Railroad Commission of Texas rates; 10, Railroad Commission of Oklahoma rates; 11, Railroad Commission of Arkansas rates; #, I. C. C. Decision 30, I. C. C., 153.

Effect of water competition on rail rates at Memphis, Tenn., as against Pine Bluff and Little Rock, Ark.

	From—						
	Buffalo, N. Y.	Detroit, Mich.	Cleve- land, Ohio.	Dayton, Ohio.	Cincin- nati. Ohio.	Kansas City, Mo.	St. Louis. Mo.
Distance to—							
Memphis, Tenn.....miles..	815	752	756	548	494	484	305
Pine Bluff and Little Rock, miles.....	952	889	893	685	631	514	358
First class rate to—							
Memphis, Tenn.....	\$0.91	\$0.91	\$0.91	\$0.75	\$0.75	\$0.80	\$0.65
Pine Bluff and Little Rock..	1.527	1.425	1.425	1.342	1.219	1.10	1.00
Rate per ton per mile to—							
Memphis, Tenn.....	.0223	.0242	.0241	.0274	.0304	.0331	.0426
Pine Bluff and Little Rock..	.0321	.0321	.0319	.0392	.0386	.0428	.0558
Rate per ton per mile to Mem- phis applied to mileage to Pine Bluff and Little Rock.....	1.062	1.076	1.075	.937	.958	.849	.763
Reducing present rate to Pine Bluff and Little Rock.....	.465	.35	.35	.405	.26	.251	.237
Saving per ton.....	\$9.30	\$7.00	\$7.00	\$8.10	\$5.20	\$5.02	\$4.74

LETTER OF TRAFFIC BUREAU OF THE CHAMBER OF COMMERCE, PINE BLUFF, ARK.

NOVEMBER 11, 1915.

GENTLEMEN: On October 1, 1914, the traffic bureau of the Chamber of Commerce of Pine Bluff, Ark., filed with the Interstate Commerce Commission a petition asking for the establishment of through river and rail rates from producing territory east of the Mississippi River to Pine Bluff, to be made by adding to the rail rates to Memphis, Tenn., the boat rates from Memphis to Pine Bluff.

This petition was filed only after a great deal of study and thought on the subject, and founded on the belief that its success would mean that a very great part of the present all-rail traffic would then move by river, giving to the consuming public the use of this natural avenue of commerce, which public interests demand should be utilized to the fullest extent, and naturally lowering the cost of transportation by reason of the movement by river.

Railroad competition undoubtedly has more to do with the falling off of river traffic than any one other factor, and Congress evidently had this in mind when it passed that part of the Panama Canal act that amended the act to regulate commerce and gave to the Interstate Commerce Commission the power to declare boat lines common carriers and to require them to join in with the all-rail carriers in the establishment of through rail-and-water rates. Since this authority has been granted the commission they have passed upon several petitions similar to ours, the most important of which are: Decatur Navigation Co. v. Louisville & Nashville Railroad Co., 31 I. C. C., 281; Chattanooga Packet Co. v. Illinois Central Railroad Co., 33 I. C. C., 384; Tampa Board of Trade v. Louisville & Nashville Railroad Co. et al., 30 I. C. C., 377; Bowling Green Business Men's Club v. Evansville & Bowling Green Packet Co. et al., 31 I. C. C., 301; Kansas City Missouri River Navigation Co. v. Chesapeake & Ohio Railway et al., 34 I. C. C., 67.

The favorable action by the commission in the above-named cases, where the circumstances and conditions were the same as in our case, prompted and influenced us in the filing of our petition.

Our case has been submitted to the commission after considerable expense and has been presented to them in oral argument at Washington, D. C.

Believing, as we do, that the commission will grant our request, as has been done in the other cases, we will have opened to us the natural artery of commerce and can use it as it has never been used before, moving those necessities of life that now move exclusively by rail partly by water at a reduction of possibly 20 per cent in freight charges and saving to the community served by Pine Bluff as a jobbing center a sum estimated at from \$50,000 to \$100,000 per year. But should the present work on the Arkansas River be stopped, we will be annihilated as a river point and our last attempt, based upon the law and believed to be the only way to restore the river traffic, will go for naught.

We ask you, therefore, to give this matter a very careful consideration in passing upon the continued improvement of the Arkansas River.

We attach hereto a copy of our petition to the Interstate Commerce Commission, together with statements of the rates now applying both by rail and water to Pine Bluff.

Submitted in behalf of the shippers and receivers of freight of Pine Bluff, Ark., who maintain the traffic bureau, by

Yours, truly,

W. M. TAYLOR, *Commissioner*.

The BOARD OF ENGINEERS FOR RIVERS AND HARBORS.

STATEMENT OF PINE BLUFF TRAFFIC BUREAU.

Before the Interstate Commerce Commission. Pine Bluff Traffic Bureau, petitioner, *v.* Louisville & Nashville Railroad Co.; Nashville, Chattanooga & St. Louis Railway; Southern Railway Co.; St. Louis & San Francisco Railroad Co. (James W. Lusk, W. B. Biddle, and W. C. Nixon, receivers); Mobile & Ohio Railroad Co.; Illinois Central Railroad Co.; The Baltimore & Ohio Southwestern Railroad Co.; The Baltimore & Ohio Railroad Co.; The Cleveland, Cincinnati, Chicago & St. Louis Railway Co.; Pennsylvania Co.; The Pennsylvania Railroad Co.; The Pittsburgh, Cincinnati, Chicago & St. Louis Railway Co.; Erie Railroad Co.; The Cincinnati, Hamilton & Dayton Railway Co. (Judson Harmon and Rufus Smith, receivers); The Michigan Central Railroad Co.; Pere Marquette Railroad Co. (Dudley E. Waters, Frank W. Blair, and Paul H. King, receivers); Grand Trunk Western Railway Co.; Grand Trunk Railway Co. of Canada; The Wabash Railroad Co. (E. B. Pryor, receiver); Chicago & North Western Railway Co.; Chicago, Milwaukee & St. Paul Railway Co.; Memphis & Arkansas City Packet Co.; Pine Bluff & Rosedale Packet Co.; Lee Line Steamers; River & Rail Storage Co., respondents.

AMENDMENT TO PETITION.

Comes your petitioner and asks leave of the commission to amend its petition as follows, to wit:

That the petitioner is an auxiliary branch of the Chamber of Commerce of Pine Bluff, Ark., a corporation organized and existing under the laws of the State of Arkansas.

That in addition to the Memphis & Arkansas City Packet Co. and Pine Bluff & Rosedale Packet Co. the Lee Line Steamers are also common carriers, operating freight and passenger steamboats and freight barges between Memphis, Tenn., Arkansas City, Ark., and Rosedale, Miss., and other points.

That the River & Rail Storage Co. is a corporation under the laws of the State of Tennessee, located at Memphis, Tenn., with sidetrack and switching facilities connecting their warehouse and boat landing with every railroad line entering Memphis, Tenn., and have a physical connection between such railroad lines and packet steamboat and barge lines plying on the Mississippi River from Memphis south to Arkansas City, Ark., Rosedale, Miss., and other points.

Wherefore your petitioner prays, as in its original petition, that the said Lee Line Steamers and River & Rail Storage Co. be severally required to answer the charges herein; that the joint rates prayed for in the original petition be proportional rates; and that a physical connection be declared to exist between the railroads entering Memphis, Tenn., and the packet steamboat and barge lines above named.

PINE BLUFF TRAFFIC BUREAU,
By W. M. TAYLOR.

ROWELL & ALEXANDER, *Pine Bluff, Ark.,*
Attorneys for Petitioners.

Before the Interstate Commerce Commission. Pine Bluff Traffic Bureau, petitioner, *v.* Louisville & Nashville Railroad Co., Nashville, Chattanooga & St. Louis Railway, Southern Railway Co., St. Louis & San Francisco Railroad Co. (James W. Lusk, W. B. Biddle, and W. C. Nixon, receivers), Mobile & Ohio Railroad, Illinois Central Railroad Co., The Baltimore & Ohio Southwestern Railroad Co., The Baltimore & Ohio Railroad Co., The Cleveland, Cincinnati, Chicago & St. Louis Railway Co., Pennsylvania Co., Pennsylvania Railroad Co., The Pittsburgh, Cincinnati, Chicago & St. Louis Railway Co., Erie Railroad Co., Cincinnati, Hamilton & Dayton Railway Co. (Judson Harmon and Rufus Smith, receivers), Michigan Central Railroad Co., Pere Marquette Railroad (Dudley E. Waters, Frank W. Blair, and Paul H. King, receivers), Grand Trunk Railway System, Wabash Railroad (E. B. Pryor, receiver), Chicago North Western Railway Co., Chicago, Milwaukee & St. Paul Railway Co., Memphis & Arkansas City Packet Co., Pine Bluff & Rosedale Packet Co., respondents.

PETITION.

The petition of the above-named petitioner respectfully shows:

I. That the Pine Bluff Traffic Bureau is a voluntary organization of the receivers and shippers of freight of Pine Bluff, Ark., operated by and for their mutual protection in matters pertaining to rates and transportation.

II. That the respondents above named are common carriers engaged in the transportation of passengers and property by railroad and by water between points in the States of New York, Pennsylvania, Ohio, Indiana, Michigan, Wisconsin, Minnesota, Illinois, Kentucky, West Virginia, Tennessee, Georgia, and Mississippi, and points in the State of Arkansas, and as such carriers are subject to the provisions of the act to regulate commerce approved February 4, 1887, and acts amendatory thereof and supplementary thereto.

III. That the respondent rail lines operate through routes and joint rates by rail from points of origin in the States named to Memphis, Tenn., and to Pine Bluff, Ark. (See Exhibits A and B for statement of rates from territories named.) That respondent water lines operate joint rates from Memphis, Tenn., to Pine Bluff, Ark., as follows: From Memphis to Rosedale, Miss., on the Mississippi River, via the Memphis & Arkansas City Packet Co.; from Rosedale, Miss., to Pine Bluff, Ark., on the Arkansas River, via the Pine Bluff & Rosedale Packet Co. (See Exhibit A for statement of through joint water rates.)

IV. That respondent rail lines operating into Memphis, Tenn., have been importuned with the request that they establish through routes and joint rates from points in the States mentioned in paragraph II to apply by rail to Memphis, Tenn., and thence by the Mississippi and Arkansas Rivers, Memphis to Pine Bluff, Ark., and that these rates be less per hundred pounds than the present through all-rail rates, as named in Exhibit A. No reply has been made to this request.

V. The Arkansas River is 1,600 miles long, and, next to the Missouri River, is the longest tributary of the Mississippi River. It has its source in the Rocky Mountains. After breaking through the Colorado canyons it flows through Kansas, Oklahoma, and cuts Arkansas into nearly equal parts, entering Arkansas at Fort Smith and emptying into the Mississippi River opposite Rosedale, Miss. In former years boats were operated upon it as far as Fort Smith, approximately 400 miles from its mouth, but of late years the operation of boats has gradually decreased in volume and distance until at the present time Pine Bluff, Ark., located approximately 110 miles from the mouth, is the head of navigation, and traffic has been kept up continuously from and to Pine Bluff, with the possible exception of one or two years. Reasons other than those of competition will be shown as a cause for the decrease in river traffic.

VI. At the present time the steamer *Lightwood*, a freight and passenger steamboat operated by the Pine Bluff & Rosedale Packet Co., operates approximately nine months in the year, carrying passengers and freight such as is tendered to it, and, with the Memphis & Arkansas City Packet Co., operating from Memphis to Rosedale, Miss., is able to meet all reasonable requirements of connecting railways with respect to security for freight charges, adequacy of service, efficiency of management, and any other guaranty which may justly and lawfully be required should this petition be granted.

VII. By reason of the facts set forth in the foregoing paragraphs, the petition request for establishment of through routes and joint rates not having been granted, they have been subjected to the payment of rates that are unduly discriminatory and in violation of section 3 of the act to regulate commerce.

Wherefore petitioner prays that respondents may be severally required to answer the charges herein, and after due hearing and investigation an order be made commanding said respondents, and each of them, to cease and desist from the aforesaid violation of said act to regulate commerce, and establish and put in force, and apply in the future, through routes and joint rates via rail and water lower than the present through all-rail rates from the points of origin shown in Exhibit A to Pine Bluff, Ark., this authority being vested in the commission as outlined in section 15 of the act to regulate commerce.

PINE BLUFF TRAFFIC BUREAU,
By W. M. TAYLOR, *Commissioner*.

Dated at Pine Bluff, Ark., October 1, 1914.

EXHIBIT A.

Through all-rail class rates applying to Pine Bluff, Ark.—Western classification.

From—	Classes.									
	1	2	3	4	5	A	B	C	D	E
	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.
Atlanta-Knoxville.....	116	98	75	57	42	46	37	32	28	21
Birmingham-Chattanooga.....	110	93	71	54	40	43	35	30	26	20
Chicago, Ill.....	120	101	77	59	44	48	40	34	29	23
Cincinnati, Ohio.....	120	101	77	59	44	48	40	34	29	23
Dayton-South Bend, Ind.....	132	112	85	65	48	50	42	37	33	28
Des Moines.....	125	107	83	63	45	49	40	35	31	24
Detroit-Cleveland.....	140	130	92	68	53	55	46	39	35	29
Louisville, Ky.....	111	94	71	54	40	43	35	30	26	20
Macon.....	121	102	77	59	43	47	38	33	29	22
Milwaukee, Wis.....	120	101	77	59	44	48	40	34	29	23
Nashville, Tenn.....	106	90	69	52	39	42	34	29	25	19
Pittsburgh, Pa.....	150	130	97	72	56	59	48	43	39	33

Tariff reference: Leland's S. W. L. Tariff 45 J, I. C. C. 1017.
Water rates applying by boat from Memphis, Tenn., to Pine Bluff, Ark. Classes: 1, 45 cents; 2, 40 cents; 3, 30 cents; 4, 25 cents; 5, 25 cents.

EXHIBIT B.

All-rail rates in effect to Memphis, Tenn.—Southern classification.

From—	Note.	Classes.											
		1	2	3	4	5	6	A	B	C	D	E	H
		Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.
Chicago, Ill.....	C	85	65	55	43	37	31	21	32	21	18	25	50
Cincinnati, Ohio.....	A	75	60	55	40	35	30	20	30	30	17	24	49
Cleveland, Ohio.....	B	91	70	59	46	39	33	23	34	23	20	27	53
Dayton, Ohio.....	B	75	60	55	40	35	30	20	31	30	17	24	49
Detroit, Mich.....	B	91	70	59	46	39	33	23	34	23	20	27	53
Louisville, Ky.....	A	65	50	45	35	30	25	15	26	15	12	20	42
Milwaukee, Wis.....	C	91	70	59	46	39	33	23	34	23	20	27	53
Nashville, Tenn.....	A	50	38	35	27	23	19	11	21	10	9	15	32
Pittsburgh, Pa.....	B	91	70	59	46	39	33	23	34	23	20	27	53
St. Paul, Minn.....	D	115	90	76	61	51	44	31	43	.....	.....	43	60
South Bend, Ind.....	B	85	65	55	43	37	31	21	33	21	18	25	57

Tariffs naming rates not available for Atlanta, Ga., Knoxville, Tenn., Birmingham, Ala., Chattanooga, Tenn., Macon, Ga.
Tariff references: A, Washburn's Mississippi River Points Tariff No. 6, I. C. C., 86; B, Eugene Morris's Tariff 15 H, I. C. C., 471; C, C. E. Fulton's Tariff 108 E, I. C. C., A 108; D, W. H. Hosmer's W. T. L. Tariff 80 A, I. C. C., A 421.

STATEMENT OF TRAFFIC BUREAU OF THE CHAMBER OF COMMERCE, PINE BLUFF, ARK.

Statement of the operations of the steamer *Lightwood*.—The steamboat *Lightwood* is owned and operated by the Pine Bluff & Rosedale Packet Co., John D. Crockett, president; D. H. Saunders, vice president; Joe C. Meyer, secretary and general manager. The *Lightwood* operates in the Arkansas River between Pine Bluff and Rosedale, Miss. She leaves Pine Bluff every Wednesday and Rosedale every Friday, making all necessary stops at landings on the river intermediate.

Tonnage handled by the "*Lightwood*" during the 12 months ending Oct. 31, 1915.

Commodity.	Tons.	Commodity.	Tons.	Commodity.	Tons.
Brick.....	12	Hay.....	100	Rice.....	1,600
Cotton.....	1,400	Lumber.....	600	Total.....	10,125
Cotton seed.....	1,000	Merchandise.....	4,588		
Cottonseed meal.....	15	Oats.....	180		
Corn.....	190	Potatoes.....	40		

STATEMENT OF MR. C. L. HOLLAND.

The development of the inland waterways of this country are receiving more attention from the Government each year. Already large appropriations have been made by Congress and expended for the building of canals and improving of the principal streams and harbors of the Eastern and Central States east of the Mississippi River.

These people, realizing the great importance of and uses of their streams in the developing of manufacturing and mineral resources, have very properly seen to it that those water improvements have been made.

The streams west of the Mississippi River have received no attention until very recently. We are a new country—just a land of cotton and cattle. There was no need for river improvement, but conditions have changed. The Panama Canal has been built; the eyes of the world have been turned to the new South, to its limitless resources. The captains of industry are bringing the capital and skilled labor to develop them. The wheels of manufacturing and industry are beginning to hum, when but a little while ago the darky with his mule was attending his little cotton patch and the cowman rounded up his herd of wild cattle. But now great cities are growing; cow paths have given way to modern highways. It is but natural that the people living in the valley of the great Arkansas River should ask that the development of this stream be made to keep pace with the domestic improvements being made by them. My own State of Oklahoma has taken its place alongside of other Southern States; its citizens are cosmopolitan, realizing as they do the importance of the Arkansas River improvement, they may be counted upon to do their part toward getting them. Tulsa, for whom I am especially delegated to represent, is prepared to show as great if not a greater tonnage of freight for river commerce as any city on the Arkansas River. With 130 square miles of coal land having two veins of coal the thinnest of which will produce 3,500 tons to the acre, with great quantities of crude and refined oil, and almost limitless beds of shale, from which a very fine quality of brick is manufactured, and with the great oil-well supply houses and manufacturers of oil-well machinery you can readily understand why we have an immense tonnage of heavy freight that is asking for cheap water transportation. However, Tulsa does not come asking for the mere development of her section of the river, but they come asking for the improvement of the Arkansas River from its mouth to its head. They believe that all the citizens living in this great valley have a common interest. The facts and figures concerning the tonnage that Tulsa could furnish for commerce on the Arkansas River will be presented by my colleague.

I will now proceed to discuss another phase of river development:

Most of the statements and evidence submitted to you now and heretofore have been along the line of the improvement of the Arkansas River for the purpose of navigation. The proper improvement of this stream may serve another and even more important purpose than that of navigation, namely, water conservation. The Arkansas River is about 2,000 miles long and extends about equal length through the States of Colorado, Kansas, Oklahoma, and Arkansas. Some idea of its magnitude and importance may be had by consulting the new International Encyclopedia, volume 2, page 19. It says: "The Arkansas River, next to the Missouri, is the largest tributary of the Mississippi. It is about 2,000 miles long, is navigable for a distance of 650 miles from its mouth, and drains an area of 188,000 square miles." The statement that the Arkansas River is navigable for a distance of 650 miles from its mouth is of especial significance to Tulsa, because this city is only about 500 miles from its mouth and therefore is well within the limits of navigation.

The improvement of this river above Tulsa with a system of locks and dams is being advocated by people who have given this matter serious thought. Not only will the upper part be benefited by this great system, but the lower part as well. During the flood season these dams will gather large volumes of water and would greatly retard the swift onrush of the flood, so that the lower valleys of the Arkansas and Mississippi Rivers would not be suddenly overflowed, causing great damage to property.

It is estimated that the loss some years by a drought in the upper valley is about \$30,000,000, and by floods in the lower valley \$35,000,000, and that each year's loss would more than make the improvements necessary to prevent these calamities. By building dams at intervals along this stream, large reservoirs would be formed for storing water during the rainy season, and this water would evaporate into the air and form rain during the heated dry season.

This would greatly benefit the growing crops in the upper valley, known as the western plains of Colorado, Kansas, and Oklahoma. The swift onrush of the flood would be held back by these dams, large volumes of water would be gathered, and the sudden overflow of the Mississippi and Arkansas Valleys would be prevented.

The United States engineers report that the average fall of the Arkansas River above Tulsa is about 2 feet to the mile. Estimating from this basis, the dams would be about 15 miles apart. The river is about 1,500 miles in length above Tulsa, therefore it would be necessary to build about 100 dams. The average width of the river is not to exceed 1,000 feet, therefore the dams would be about 1,000 feet long and 20 feet high. These locks and dams ought to be built at a cost approximating \$15,000,000. Judging the allowance made by the Government for dredge boats on the lower Arkansas, there would be two boats for every 150 miles, or 20 boats, costing \$200,000 each, or \$4,000,000. Allowing \$11,000,000 for other necessary material and labor to clear the channel, we believe the work could be completed for \$30,000,000. These dredge boats would remove the sand from each side of the river, forming embankments to prevent the valley from flooding from high water.

These figures are based on reports which have been made from time to time by Government engineers, together with other well-known facts, and, while we do not pretend that they are accurate, yet they will serve to give an idea of what may be done by locks and dams to improve the great Arkansas River.

The United States Government is spending \$40,000,000 to build a railroad in Alaska, and we believe that \$30,000,000 spent upon the Arkansas River will do a great deal more good to the people of this country.

C. L. HOLLAND, *Tulsa, Okla.*

STATEMENT OF MR. E. N. ADAMS.

Mr. Holland, who has just preceded me, has given your honorable board an outline of the improvements that should be made on the Arkansas River, together with the purposes of said improvements, and I believe the same should receive your most earnest consideration. I have been delegated by the interests in Tulsa to present to this board statistics showing the annual amount of freight tonnage which is handled in and out of our city. Before going into this it might be well to give you some little information as to what kind of a city we have, also how the same has progressed during the last few years in the matter of population, and I also believe that the bank clearings enter a great deal into what a city is doing. In 1905 Tulsa had a population of 5,000, in 1910 we had a population of 18,182. During April, 1915, at the solicitation of the interests in Tulsa, through our chamber of commerce, the Federal Government took a census of our city, which showed a population of 28,240 within the corporate limits. We have numerous additions to our city, which are fairly well built up and are outside of the corporate limits, so that we firmly believe we have a population at the present time of not less than 37,000. The Tulsa Clearing House Association was formed in 1911, so we are unable to go back of that period. The bank clearing for the year 1911 amounted to \$32,035,156 and for the 10 months ending October 31, 1915, \$58,740,232. In the past and at present Tulsa is using gas and oil for manufacturing purposes and there seems to be no limit to either.

Tulsa and vicinity is underlaid with as high a grade of bituminous coal as will be found anywhere in the United States. The chemical analysis of this coal shows water, 4.78 per cent; volatile matter, 38.05 per cent; fixed carbon, 53.20 per cent; ash, 3.97 per cent. Sulphur, separately determined, 1.26 per cent; calorific value, 13,057 per cent British thermal units per pound. The vein is over 100 miles long and 25 miles wide. It commences in Rogers County at a point about 30 miles north and a little east of Tulsa and extends southwesterly through Tulsa to Henryetta. This vein of coal is almost inexhaustible and ranges from 2 to 3 feet thick. It is conservatively estimated that there are 80,000 acres of strip or shallow coal, which lies from 6 to 20 feet underneath the ground and can be stripped by teams and scrapers or steam shovels. The inexhaustible supply of coal lies from 60 to 250 feet underneath the ground. This strip coal will run close to 4,000 tons per acre. There are at present in Tulsa County four deep shaft mines in operation, and from the estimate given me they are now getting out between 25,000 and 30,000 tons of coal per month, and this is increasing right along. The chemical

analysis shows this coal to be of very superior quality and is a free-burning bituminous hard coal, most excellent for domestic and steam purposes and is absolutely free from gas. You will very readily gather from this that Tulsa will be some day just what we claim, and that is she will be the manufacturing city in the State of Oklahoma.

Now, in regard to the amount of tonnage which has been handled in and out of Tulsa during the past year, we have been somewhat handicapped in getting this information together, as the business men in Tulsa are certainly a very busy class of people, and we have been able to secure this information from only 22 of our largest industries, and these figures only cover carload business with the exception of groceries, which include both carload and less-than-carload shipments. I have also prepared a statement showing a classified list of all of the receivers and shippers of freight in Tulsa, and I would like permission to file copies of both of these statements with this board.

In regard to the inbound tonnage we have handled during the past year—that is, the year ending October 31, 1915—16,616 tons of groceries, 3,000 tons of structural iron, 5,563 tons of bar iron, 6,531 tons of steel plates, 839 tons of galvanized iron, 667 tons of pig iron, 130 tons of plain and woven wire, 200 tons of barbed wire, 549 tons of coke and coal facings, 48 tons of boilers and machinery, 44 tons of pumps, 50 tons of paint, 29,394 tons of pipe and pipe fittings, 5,772 tons of oil-well supplies, and 1,853 tons of miscellaneous carload freight, which makes a grand total of 70,591 tons of freight which 22 concerns have received in Tulsa during the past year. As to the outbound freight, we have only taken the refined oil, and that does not begin to take in all of the refined oil which has moved out of Tulsa during the past year. Five concerns have shipped 462,290 tons of oil to points in the United States and 250,255 tons of oil was exported through the ports of New Orleans, La., and Port Arthur, Tex. I want to call particular attention to the fact that this tonnage moved in and out of Tulsa, Okla. Were we to include the tonnage for a radius of 50 miles, as was done by Kansas City, the amount we have shown would be a very small item. For instance, we have a very large development of oil in what is known as the Cushing field, which lies to the southwest of us, and it is estimated that during the last year and a half there has been shipped into this field alone approximately 10,000 cars of pipe, which would average nearly 100,000 pounds to the car, 4,000 cars of steel plates, which would average not less than 70,000 pounds per car, and about 5,000 cars of lumber, which will average about 45,000 pounds per car. This material all being used to build storage tanks for crude oil. If the Arkansas River was improved so that the same could be used for the transportation of freight, our coal business would have a wonderful development; and, as a matter of fact, river transportation would develop the State of Oklahoma, and it can not now be developed as it should with the high rate of transportation by rail, and it is taxing the facilities of the rail carriers to handle the business now offered.

E. N. ADAMS, *Tulsa, Okla.*

STATEMENT OF MR. E. N. ADAMS IN RE TULSA, OKLA.

Inbound freight:	Tons.	Inbound freight—Continued.	Tons.
Groceries -----	16, 616	Oil-well supplies -----	5, 772
Structural iron -----	3, 000	Miscellaneous -----	1, 853
Bar iron -----	5, 563		
Steel plates -----	6, 531	Total -----	70, 591
Galvanized iron -----	839		
Pig iron -----	667	Outbound freight:	
Woven wire -----	100	Refined oil to points in	
Plain wire -----	30	the United States -----	462, 290
Barbed wire -----	200	Refined oil for export	
Coke -----	527	through the ports of	
Coke facings -----	22	New Orleans, La., and	
Boilers and machinery ---	48	Port Arthur, Tex -----	250, 255
Pumps -----	44		
Paint -----	50	Total -----	712, 545
Pipe and pipe fittings ----	29, 394		

Auto supplies.—American Auto Supply Co.; Brandle Motor Co.; Jeffrey Motor Salesroom; Motor Supply Co.; United States Tire Manufacturers; Western Auto Supply Co.

Automobiles.—Anderson Auto Agency; Automobile Sales Co.; Cadillac Co.; Dodge Bros. Motor Cars; Federal Motor Co.; Ford Co. of Tulsa; Hudson Motor Cars; Hupmobile Service Co.; K. C. Auto Co.; Maxwell Motor Co.; Midland Auto Co.; New State Auto Co.; Oldsmobile Co.; Overland Salesroom; Paige Motor Car Co.; Studebaker Car Agency; Tulsa Motor Car Co.; E. Westerman; Winton Auto Sales Co.

Awning and tent companies.—National Tent & Awning Co.

Belts.—Producers' Supply Co.

Boiler manufacturers.—Mount Cooper Boiler & Iron Co.

Boiler repair shops.—Horrigan Boiler Works.

Brick, tile, and cement companies.—Tulsa Brick Co.; Tulsa Vitritied Brick Co.

Building material.—Standard Roofing & Material Co.

Building supplies.—Builders Supply Co.

Cabinet manufacturcrs.—Tulsa Cabinet Manufacturing Co.

Carriage works.—Reedy Carriage Works.

China stores.—J. A. Harmuth China Co.

Cigars and tobacco.—William A. Burton (wholesale); Heyman Tobacco Co. (wholesale).

Clothing and furnishings.—Agee Clothing Co.; The Globe Clothing Co.; Golden Gate Store; Model Clothiers; Palace Clothiers; Phoenix; Plymouth Clothing Co.; Renberg Clothing Co.; A. Skuy; Paul A. Spitzer; Wright's Clothing.

Coal, wood, and fuel.—Canadian Coal Co.; Hickory Coal & Mining Co.; Marnet Mining Co.; Mohawk Coal Mining Co.; New State Coal Co.; Southwest Coal Co.; Tulsa Coal Co.; United Fuel Supply Co.

Commission companies.—Moore Commission Co.

Cone manufacturing companies.—Tulsa Cone Manufacturing Co.

Confectioners.—M. & B. Candy Co. (wholesale); J. A. Waldrep (wholesale).

Cotton and cotton oil companies.—Tulsa Cotton Oil Mill.

Decorators and painters.—Home Decorating Co.; Oklahoma Paint & Wall Paper Co.; Tulsa Decorating Co.

Drug stores.—Baker Drug Co.; Holmes & Hoover; Kendell Drug Co.; Quaker Drug Co.; The Rexall Drug Store; Shackle Drug Co.; Tulsa Drug Co.; Weaver Drug Co.; Younkman Red Cross Pharmacy.

Electrical supplies.—Brite Electrical Construction Co.; Deshon & Davison Electric Co.; Dodge Electric Co.; Electric Contracting Co.; Electric Storage Battery Service Co.; Electrical Supply Co.; Sand Springs Supply House; Southwestern Light Co.

Elevator companies.—Otis Elevator Co.

Explosives, dynamite.—Atlas Powder Co.

Feed, grain, and hay.—Arthur & McCune; A. H. & G. W. Sanders; J. O. Stewart; J. E. Thompson; Tulsa Feed Store; Wilcox & Son.

Fishing tool company.—Acme Fishing Tool Co.

Furniture companies.—Atherton Auction & Furniture Co.; Bargain Furniture Co.; Bass Furniture & Carpet Co.; Bowers Furniture Hospital; Bungarner & Downing; Commission Furniture Co.; Diamond Furniture Co.; W. C. Farmer; Flack Furniture Co.; T. E. Genet; Jacobs Furniture Co.; Koons & Chastain; McPherson Furniture Co.; Miller Furniture Co.; North Side Furniture Co.; Oklahoma Auction Furniture Co.; Peoples Furniture Co.; Shannon Furniture Co.; Stanford Furniture Co.; Tulsa Household Supply Co.

Garment companies.—Tulsa Garment Manufacturing Co.; Tulsa Shirt Co.

Gas engine companies.—Bessemer Gas Engine Co.; Pattin Bros. Co.; Joseph Reid Gas Engine Co.

Gas meters.—Westcott & Greis.

Glass company.—Tulsa Glass Co.

Wholesale grocers.—Hale-Halsell Grocery Co.; Ratcliff-Sanders Grocer Co.; Upp Grocery Co.

Hardware.—E. E. Chartier, Ewing Hardware Co.; M. C. Hale; C. H. Justice; H. O. McClure; C. A. & W. F. Nichols Hardware Co.; Tulsa Hardware Co.

Hides and furs.—Tulsa Hide Co.

Horse and mule market.—R. A. Dunn.

Implements.—Lon R. Stansberry.

Iron works.—Hammond Iron Works; Oklahoma Iron Works.

Junk companies.—Oil Field Supply Co.; Tulsa Junk & Bottle Co.; Tulsa Supply & Junk Co.

Light and power company.—Public Service Co.

Lithograph company.—Western Bank Supply Co.

Lumber companies.—T. J. Carter; H. R. Crews Lumber Co.; A. L. Davis Lumber Co.; Dickeson-Goodman Lumber Co.; S. M. Gloyd; H. E. Ketchan; Miller & Geck; Minnetonka Lumber Co.; Misener Lumber Yard; T. L. Neves; Robinson Lumber Co.; Rounds & Porter Lumber Co.; Turley Lumber Co.; Weber Lumber Co.

Machine shops.—Marion Machine Foundry; Pennsylvania Welding & Brazing Co.; Robinson Packer & Machine Co.

Manufacturers.—H. W. Johns Manville Co.; Tulsa Auto & Manufacturing Co.; Tulsa Boiler & Manufacturing Co.; Tulsa Machine & Tool Co.; Tulsa Manufacturing & Supply Co.; Tulsa Mattress Factory; Tulsa Rig-Reel & Manufacturing Co.

Mill and elevator company.—Rea-Read Mill & Elevator Co.

Music stores.—Allen & Theda; Darrow Music Co.; J. W. Jenkins Sons Music Co.; McMillon Piano Co.; Tulsa Music Co.

Newspapers, magazines, and periodicals.—Tulsa Daily Democrat; World Publishing Co.

Office supplies.—Oklahoma Safe & Fixture Co.

Oil and gas companies.—Oklahoma Oil Co.; Riverside Western Oil Co.; Southern Oil Corporation.

Oil well supply companies.—Anderson Manufacturing Co.; Atlas Supply Co.; Bovaird Supply Co.; Continental Supply Co.; John Finlayson Co.; Frick Reid Supply Co.; Jarecki Manufacturing Co.; McEwen Manufacturing Co.; National Supply Co.; Oil Field Supply Co.; Oil Well Improvements Co.; Producers Supply Co.; Republic Supply Co.; Swan Under-Reaming Co.; Western Rope & Cordage Co.; Western Supply Co.; Wire Rope Appliance Co.

Oil and gas companies.—Ardizzone & Ossenbeck; Arkansas River Bed Oil & Gas Co.; H. Y. Arnold; Frank Barnes; W. M. Black; Caney River Gas Co.; J. P. Cappeau Sons; Carter Oil Co.; E. Constantin Refinery; Craver & Co.; J. E. Crosbie; Devonian Oil Co.; Eastern Oil Co.; D. W. Franchot; Galbreath Gas Co.; E. N. Gillespie; Gladys Bell Oil Co.; Gypsey Oil Co.; Henry Oil Co.; Hill Oil & Gas Co.; Oscar R. Howard; J. A. Hull; Humble Oil Co.; R. A. Josey; Kathleen Oil Lease; E. R. Kemp; M. L. Lockwood; Los Angeles Cherokee Oil Co.; Mallory & Harris; March Oil Co.; John H. Markham; McMan Oil Co.; Millikin Oil Co.; Minshall & Co.; New York Oil Co.; W. C. Newell; Oklahoma Natural Gas Co.; Oklahoma Oil Producers Agency; Oklahoma State Oil Co.; Osage & Oklahoma Co.; Chas. Page; J. Edgar Pew; Pierce Oil Corporation; Prairie Oil & Gas Co.; Producers Oil Co.; E. A. Ross; Savoy Oil Co.; H. F. Sinclair; W. G. Skelley; H. Steinberger; C. E. Strouville; Texas Co.; Turley Oil Co.; Turnbuckle Oil Co.; Twin State Oil Co.; H. C. Tyrell; F. B. Ufer Oil & Gas Co.; Uncle Sam Oil Co.; Vensel & Elliott; Vicmar Oil Co.; Western Natural Gas Co.; C. J. Wrightsman; Harvey Young Oil Co.

Packing house companies.—Armour & Co.; Independent Packing Co.

Paints and wall paper.—Brown & Canfield; Oklahoma Paint & Wall Paper Co.; Plymouth Decorating Co.; St. Louis Wall Paper & Paint Co.; Tulsa Wholesale Paint & Glass Co.

Petroleum companies.—Cosden & Co.; Magnolia Petroleum Co.; Mid-Continent Petroleum Co.; Oklahoma Petroleum & Gasoline Co.; Roxana Petroleum Co.; Southwestern Petroleum Co.

Pipe-line companies.—Cosden Pipe Line Co.; Glen Pool Pipe Line Co.; Gulf Pipe Line Co.; Millikin Pipe Line Co.; Oklahoma Glazed Cement Pipe Co.; Prairie Pipe Line Co.

Plumbing and heating.—A. D. Plumbing Co.; J. C. Atkins; J. S. Bancroft; Curtis Plumbing Co.; Bell Plumbing Co.; Gillis Plumbing Co.; Geo. W. Groves; D. W. Holmes; F. S. Kelley; Knowles & Green; Herman Kramer; E. L. Lacour; R. C. Middleton; Mack Neer; J. H. Shipherd; Henry Stoffel; Tulsa Plumbing & Cornice Co.; Watt Plumbing Co.

Produce companies.—R. R. Allen; A. K. Dawson Produce Co.; Dreyfus Bros.; Farmers & Merchants Produce Co.; Goodner-Malone Co.; R. C. Mills Co.; Oklahoma Commission Co.; T. D. Turner & Co.; Winns Commission Co.

Pumps.—H. D. Cornell.

Pumping supplies.—Skinner Bros.

Refining companies.—Constantin Refining Co.; Cosden & Co.; Chelsea Refining Co.; Mid-Continent Refining Co.; National Refining Co.; Pan American Refining Co.; Phoenix Refining Co.; Pierce Oil Corporation.

Sand and material companies.—O. K. Sand Co.; Price Sand Co.; Tulsa Sand Co.
Sash and doors.—Tulsa Cabinet Manufacturing Co.
Seed house.—Binding Stevens Seed Co.
Sewing machines.—Singer Sewing Machine Co.; Standard Sewing Machine Co.
Sheet-metal works.—Bell Sheet Metal Works; W. O. Moran; Southern Cornice Works; Stephens Sheet Metal Works; Tulsa Sheet Metal Co.; Wooldridge & Upton.
Stove company.—Queen Bee Stove Co.
Tank cars.—German American Car Co.
Tank manufacturers.—Black, Sivalls & Bryson; Maloney Tank Manufacturing Co.; Parkersburg Rig Reel Manufacturing Co.; Reeves Bros.; Standard Boiler & Plate Iron Co.; Warren City Tank & Boiler Co.
Tea and coffee company.—Hooper Bros.
Torpedo companies.—American Glycerine Co.; Central Torpedo Co.; Eastern Torpedo Co.; Independent Torpedo Co.; Kansas Torpedo Co.
Transfer and storage companies.—Nichols Transfer Co.; Page Transfer Co.; Tulsa-Red Ball Transfer Co.

Statement of Greater Muskogee Association.

From Memphis, Tenn., ¹ to—	Class and commodity rates from Memphis.										
		2	3	4	5	A	B	C	Agricul- tural imple- ments.	Cement.	Lime.
	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.
Kansas City, Mo.....	80	65	45	32	27	32	27	22	30	12½	.....
Joplin, Mo.....	80	65	50	40	31	33	27½	22	.....	.....	20½
McAlester, Okla.....	110	90	75	58	45	47	36½	30	47	27	20½
Vinita, Okla.....	101	83	73	55	43	45	36	27	39	20	20½
Muskogee, Okla.....	115	100	80	64	48	51	44	35	49	24	25

New Orleans, La., ² to—	Class.							
	1	2	3	4	5	A	B	C
	<i>Cents per 100 lbs.</i>	<i>Cents per 100 lbs.</i>	<i>Cents per 100 lbs.</i>	<i>Cents per 100 lbs.</i>	<i>Cents per 100 lbs.</i>	<i>Cents per 100 lbs.</i>	<i>Cents per 100 lbs.</i>	<i>Cents per 100 lbs.</i>
Kansas City, Mo.....	}	1.10	0.85	0.65	0.53	0.38	0.42	0.37
St. Joseph, Mo.....								
Joplin, Mo.....		1.10	.85	.65	.53	.38	.42	.37
Muskogee, Okla.....		1.35	1.18	.97	.90	.70	.74	.57

New Orleans, La., ² to—	Bags, bur- lap, gunny, or jute: also burlaps.	Canned goods, fruit, vege- tables, fish, soups, etc.	Shells, oyster.	Rice, bran chaff, hulls, and polish.	Coffee, green.	
					Carload.	Less than carload.
	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.	Cents per 100 lbs.
Kansas City, Mo.....	} 3 0.28	3 0.38	4 0.21	5 0.22	3 0.38	0.40
St. Joseph, Mo.....		0.38	.....	.....	3.35	0.40
Joplin, Mo.....		.....	4.35	5.25	3.39	1.97
Muskogee, Okla.....		6.44	.....	.....	.....	.....

¹ Authority, Oklahoma Points. F. A. Leland's 15 Series. Kansas City, A. D. Hall 1-C. Joplin, West. Trunk Line 33-D.
² Authority: New Orleans Northwestern Tariff No. 4; Trans-Missouri Tariff 15-G; Southwestern Lines Tariff No. 59.
³ Minimum weight, 30,000 pounds.
⁴ Minimum weight, 40,000 pounds.
⁵ Minimum weight, 24,000 pounds.
⁶ Minimum weight, 36,000 pounds.
⁷ Third class, single sacks.

Statement of Greater Muskogee Association—Continued.

New Orleans, La., ¹ to—	Matting.	Rice, clean (carload).	Sugar (carload).	Molasses and sirup (except fountain or coloring sirup, in- cluding glucose sirup).	Molasses, low grade, in tank cars.	
					Imported value 8 cents per gallon or less.	Domestic value 8 cents per gallon or less.
	<i>Cents per 100 lbs.</i>	<i>Cents per 100 lbs.</i>	<i>Cents per 100 lbs.</i>	<i>Cents per 100 lbs.</i>	<i>Cents per 100 lbs.</i>	<i>Cents per 100 lbs.</i>
Kansas City, Mo.....	} 2 0.88	} 3 0.37	} 4 0.32	} 5 0.30	0.17	0.20
St. Joseph, Mo.....						
Joplin, Mo.....	.65	.37	4.32	.30		
Muskogee, Okla.....	6.97	3.39	4.35	5.35	5.25	5.28

¹ Authority: New Orleans Northwestern Tariff No. 4; Trans-Missouri Tariff 15-G; Southwestern Lines Tariff No. 59

² Minimum weight, 24,000 pounds.

³ Minimum weight, 30,000 pounds.

⁴ Minimum weight, 33,000 pounds.

⁵ Minimum weight, 40,000 pounds, except in tank cars.

⁶ Third class, minimum weight 34,000 pounds.

Canned goods classification, New Orleans, La., to Muskogee, Okla.: Effective June 29, 1906, 48 cents; June 1, 1908, 51 cents; Jan. 10, 1909, 40 cents; Feb. 1, 1910, 39 cents; June 1, 1910, 44 cents. Present rates, 44 cents. Authority, Leland's 59 Series.

OUTBOUND TONNAGE.

Oil:

Muskogee Refining Co.....	3,952
Cudahy Refining Co., Muskogee plant.....	1,864
Cudahy Refining Co., Coffeyville plant.....	3,108
	8,924

Cotton, cottonseed products:

Shippers Compress Co.....	15,000
Muskogee Cotton Oil Mill.....	5,000
	20,000

Potatoes, R. T. Payne & Co

2,150

Grains and grain products:

New State Flour & Feed Co.....	4,000
Oklahoma Seed Co.....	250
Muskogee Roller Mill.....	240
	4,490

Fruit and fruit products, Eagle Cider & Vinegar Co.....

180

RECAPITULATION.

	Tons.
Oil	8,924
Cotton, cottonseed products	20,000
Potatoes	2,150
Grains and grain products	4,490
Fruit and fruit products.....	180
Total	35,744

LETTER OF MUSKOGEE REFINING CO.

MUSKOGEE, OKLA., November 12, 1915.

DEAR SIR: In reference to our telephone conversation of yesterday, regarding the amount of tonnage which could be diverted from railroad transportation companies to water route between Muskogee and New Orleans, beg to advise that our shipments in the past year have run from 5 to 30 cars per month, and we feel that 18 cars per month would strike a fair average of the entire year.

The shipments above mentioned consist of 75 barrels per car, or a gross weight of 30,750 pounds. You will readily understand that our shipments

would be a great deal heavier if it were possible for us to again ship to Germany and Austria—two of our largest customers before the war.

Yours, very truly,

MUSKOGEE REFINING Co.,
By M. H. HART.

Mr. E. D. BEVITT,
*Manager Retail Trade and Credit Bureau,
Greater Muskogee Association, Muskogee, Okla.*

LETTER OF CUDAHY REFINING CO.

MUSKOGEE, OKLA., November 12, 1915.

DEAR SIR: Complying with your request of recent date, will say that we are shipping from this point about 3,729,600 pounds of steam-refined oil to New Orleans per month.

Yours, very truly,

CUDAHY REFINING Co.,
By WILLIAM OWEN.

Mr. E. D. BEVITT, *Traffic Manager, Muskogee, Okla.*

LETTER OF CUDAHY REFINING CO.

MUSKOGEE, OKLA., November 12, 1915.

DEAR SIR: Complying with your request of recent date will say that from our Coffeyville plant we are shipping to New Orleans about 6,216,000 pounds per month of oil for export.

We are using about 20,000 pounds of fuller's earth per month which we buy in Florida.

Yours, very truly,

CUDAHY REFINING Co.
WILLIAM OWEN.

Mr. E. D. BEVITT, *Traffic Manager,
Muskogee, Okla.*

LETTER OF SHIPPERS COMPRESS CO.

MUSKOGEE, OKLA., November 13, 1915.

DEAR SIR: Referring to your inquiry relative to the tonnage moving from this point yearly via New Orleans, beg to state that last season there was exported through this press 53,000 bales cotton and 24,000 moved via New Orleans. This proportion between the two Texas ports and New Orleans is increasing each year in favor of the latter.

So far this season New Orleans has received 90 per cent of all export cotton, and indications are that this will continue.

It is safe to say that this press will always handle 75,000 bales of cotton and generally 80 per cent is exported and that the present shows that New Orleans will handle 45,000 bales for this territory, all reshipped from here, or an annual tonnage of 11,000 tons.

Yours, truly,

J. C. FAHNESTOCK, *Superintendent.*

Mr. E. D. BEVITT,
*Traffic Manager Greater Muskogee Association,
Muskogee, Okla.*

LETTER OF S. B. LOCKE & CO. (INC.).

MUSKOGEE, OKLA., November 5, 1915.

GENTLEMEN: Answering your letter of October 29 regarding our shipment and tonnage provided we could get water rate, will say that we believe we would ship 20,000 bales of cotton annually, provided we had steamers and water rate to the Gulf port.

Yours, very truly,

S. B. LOCKE & Co.,
By S. B. LOCKE.

GREATER MUSKOGEE ASSOCIATION,
Muskogee, Okla.

LETTER OF MUSKOGEE COTTON OIL MILL.

MUSKOGEE, OKLA., *November 12, 1915.*

DEAR SIR: If the Arkansas River was made navigable, you could safely count on 5,000 tons per year from us, and perhaps more. The inbound tonnage would amount to at least 3,000 tons. As to the amount of outbound tonnage, would depend largely as to the direction our product was sold. The tonnage alone on cotton seed would be around 1,500 tons from Webber Falls, to say nothing about the cotton. To garner 1,500 tons cotton seed from Webber Falls would make 3,000 bales cotton that usually move from the above place. Nearly all our linters are either sold in Memphis or New Orleans; they could be very easily handled to these points if we had river navigation. We have three mills located right on the Arkansas River, Tulsa, Muskogee, and Fort Smith. Each mill will produce around 1,500 bales linters per year.

If the navigating of the Arkansas River could be made possible it would reclaim thousands of acres of land that are now practically idle, on account of overflowing of land that is now being partly cultivated. This alone is worth looking after.

You can count on us giving you all the assistance possible.

Yours, truly,

W. E. ABERNATHY, *Manager.*

Mr. E. D. BEVITT,

*Traffic Manager Greater Muskogee Association,
Muskogee, Okla.*

LETTER OF R. T. PAYNE & CO.

MUSKOGEE, OKLA., *November 15, 1915.*

GENTLEMEN: If the Arkansas River had been navigable this fall it would have been possible to have moved 150 cars of potatoes on it. The minimum weight on potatoes is 30,000 pounds.

Yours, truly,

R. T. PAYNE & Co.,
By R. T. PAYNE.

GREATER MUSKOGEE ASSOCIATION,

Muskogee, Okla.

LETTER OF NEW STATE FLOUR & FEED CO.

MUSKOGEE, OKLA., *November 15, 1915.*

GENTLEMEN: With regard to tonnage that we could give the Arkansas River, were it navigable and with boat line operating to haul our commodities, we believe that we could ship grain and hay to Arkansas River points to the approximate amount of 4,000 tons per year.

This would include all towns along the river but mostly to Little Rock, Pine Bluff, Arkansas City, Helena, Memphis, Nashville, and to New Orleans.

Yours, truly,

NEW STATE FLOUR & FEED Co.,
M. A. MUNDING.

GREATER MUSKOGEE ASSOCIATION,

Muskogee, Okla.

LETTER OF OKLAHOMA SEED CO.

MUSKOGEE, OKLA., *November 13, 1915.*

DEAR SIR: If the Missouri River was navigable we could route shipments that way to the amount of from 200 to 300 tons annually.

Yours, very truly,

OKLAHOMA SEED Co.,
C. J. KOEPKE, *President.*

Mr. E. D. BEVITT, *City.*

LETTER OF MUSKOGEE ROLLER MILLS.

MUSKOGEE, OKLA., November 11, 1915.

DEAR SIR: Under present business conditions the amount of tonnage which we could ship by the way of Arkansas River will amount to at least 40,000 pounds per month, and under conditions which would increase business at all this amount would undoubtedly be more than double.

Yours, truly,

MUSKOGEE ROLLER MILLS,
Per RALPH L. MOSIER.

Mr. E. D. BEVITT,
Traffic Manager Greater Muskogee Association,
Muskogee, Okla.

LETTER OF THE EAGLE CIDER & VINEGAR CO.

MUSKOGEE, OKLA., November 15, 1915.

DEAR SIR: Will state we could ship approximately, by Arkansas River, about 180 tons of merchandise such as cider, vinegar, apples, barrels, etc.

Very truly, yours,

EAGLE CIDER & VINEGAR Co.,
By S. G. FELIX.

E. D. BEVITT,
Traffic Manager Greater Muskogee Association,
Muskogee, Okla.

STATEMENT OF GREATER MUSKOGEE ASSOCIATION.

Tonnage statistics.

	Tons.	
Wholesale groceries:		
Muskogee Wholesale Grocer Co.....	12,000	
Chesnut-Biggons Grocer Co.....	8,400	
Jameson Grocery Co.....	7,500	
Dunlap Bros.....	4,232	
		32,132
Packing houses:		
Armour & Co.....	175	
Swift & Co.....	500	
		675
Dry goods:		
Graham-Sykes Co.....	125	
Pegram Dry Goods Co.....	100	
		225
Clothing:		
New Phoenix Clothing Co.....	65	
O. R. Clothing Co.....	15	
		80
Boots and shoes:		
Walk-Over Boot Shop.....	9	
Cash Shoe Store.....	10	
McKinney & Redd.....	14	
		33
Hardware:		
Hooker-Hendrix Hardware Co.....	1,000	
Atlas Supply Co.....	9,650	
Crane & Co.....	300	
L. A. Perkins Hardware Co.....	300	
Oklahoma Corrugated Steel & Iron Co.....	80	
Shirar & Copeland.....	125	
Maddin-Merchant Hardware Co.....	50	
Muskogee Hardware Co.....	20	
H. B. Davis Hardware Co.....	20	
		11,545

Lumber :	Tons	
Geo. D. Hope Lumber Co.....	1,300	
Page Lumber Co.....	580	
H. E. Ketcham.....	1,051	
Marshall Lumber Co.....	1,750	
Minnetonka Lumber Co.....	1,250	
T. H. Rogers Lumber Co.....	500	
Muskogee Lumber Co.....	900	
J. A. Butts Lumber Co.....	900	
		8,231
Building material, paint, glass, wall paper, and fixtures :		
Standard Roofing & Material Co.....	50	
National Sash & Door Co.....	150	
The Craft Shop.....	1	
A. Fabbro & Co.....	150	
C. L. Dickman Glass Co.....	191	
Farrell Wall Paper Co.....	50	
Muskogee Marble & Granite Co.....	135	
Bockenheuser & Co.....	6	
Muskogee Paint & Glass Co.....	15	
R. E. Reed Paint & Wall Paper Co.....	37	
		785
Barbers' supplies, A. Halverson Co.....		36
Drugs, Cardinal Drug Co.....		12
Jewelers :		
H. L. Stern Jewelry Co.....	5	
Cohenour Rygel Co.....	2	
		7
Plumbing :		
The O'Connor Co.....	180	
Clyde C. Poole Plumbing Co.....	25	
		205
Harness and saddles :		
Thornton & Co.....	25	
O. S. Faylor.....	2	
R. B. Crittenden.....	5	
		32
Music houses :		
Kroh Music Co.....	120	
Jenkins' Sons Music Co.....	150	
		270
Furniture :		
E. F. Riley Furniture Co., now Riley-Harbour Furniture Co.....	80	
Household Furniture & Carpet Co.....	77	
Street-Eicholtz Furniture Co.....	150	
Ferguson Bros.....	100	
Todd Furniture Co.....	40	
Bewley Wholesale Furniture Co.....	22	
		469
Electric fixtures and wiring :		
Muskogee Electric Co.....	15	
Peabody Electric Co.....	50	
		65
Office supplies :		
Phoenix Office Supply Co.....	2	
Burroughs Adding Machine Co.....	17	
		19
Job printing, bookbinding, and supplies :		
Model Printing Co.....	5	
Phoenix Job Printing.....	15	
The Star Printing Co.....	1	
		21
Paper, news print, etc. :		
Adleta Paper Co.....	400	
The Muskogee Times Democrat Co.....	304	
Phoenix Printing Co.....	300	
		1,004

	Tons.
Manufacturers:	
The Roberts Mattress Manufacturing Co.	468
Eagle Hay Press & Implement Co.	90
Empire Fixture Works	70
Eagle Broom Co.	3
J. C. Wynn	247
Wheat's Wood Workers	35
Muskogee Iron Works	1,000
Muskogee Tool Co.	375
O. K. Sheet Metal Co.	50
Muskogee Vehicle & Machinery Co.	300
Muskogee Carriage & Automobile Works	20
Oklahoma Wagon Works	20
W. R. Lantz Carriage & Automobile Works	200
Shiff Cigar Co.	1
	<hr/> 2,879

RECAPITULATION.

Wholesale groceries	32,132
Packing houses	675
Dry goods	225
Clothing	80
Boots and shoes	33
Hardware	11,545
Lumber	8,231
Building material	785
Barbers' supplies	36
Drugs	12
Jewelry	7
Plumbing	205
Harness and saddles	32
Music houses	270
Furniture	467
Electrical fixtures and wiring	65
Office supplies	19
Job printing, bookbinding, and supplies	21
Paper, news print, etc.	1,004
Manufacturers	2,879
Total	<hr/> 58,725

LETTER OF MUSKOGEE WHOLESALE GROCER CO.

MUSKOGEE, OKLA., November 8, 1915.

DEAR SIR: We beg to advise that our tonnage for the past year amounted to about 20,000 tons, a large percentage of which could move via the Arkansas River were that stream navigable.

We cheerfully pledge ourselves to route every pound possible via any responsible boat line that operates on the river.

Yours truly,

MUSKOGEE WHOLESALE GROCER CO.,
By R. S. DAVIS,
President.

Mr. E. D. BEVITT,
Traffic Manager Greater Muskogee Association.
Muskogee, Okla.

LETTER OF CHESNUTT-GIBBONS GROCER CO.

MUSKOGEE, OKLA., November 11, 1915.

DEAR SIR: We handle about 12,000 tons of freight per year and at least 60 per cent of it could be routed via the Arkansas River, provided that streams were open to navigation.

We can assure you that we would do everything in our power to assist any responsible boat line operating on the river, as we believe that the improvement and navigation of the Arkansas River is essential to the future development of this section of the country.

Yours truly,

CHESNUTT-GIBBONS GROCER CO.,
H. M. CHESNUTT,
President.

Mr. E. D. BEVITT,
Traffic Manager Greater Muskogee Association.
Muskogee, Okla.

LETTER OF JAMESON GROCERY CO.

MUSKOGEE, OKLA., November 10, 1915.

DEAR SIR: In reply to your letter of November 3 in reference to Arkansas River navigation, while we hardly understand just what tonnage you would wish to include in that, beg to say that, based on our past year's shipments, we handle about 8,000 to 10,000 tons annually. A very large portion of this would be available for river transportation.

We might further add that as we are contemplating opening a branch house in Little Rock the coming year, we would have about the same amount additional for that place.

Very respectfully,

JAMESON GROCERY CO.,
Per O. JAMESON,

Mr. E. D. BEVITT,
Traffic Manager Greater Muskogee Association,
Muskogee, Okla.

STATEMENT OF DUNLAP BROS.

	Pounds.
150 cars flour, 40,000 pounds each-----	6,000,000
Sugar, 10 cars, 60,000 pounds each-----	600,000
Coffee-----	125,000
5 carloads canned goods, 40,000 pounds each-----	200,000
10 cars sirup, 40,000 pounds each-----	400,000
Meat and lard-----	400,000
Other groceries-----	500,000
Hosiery, notions, etc-----	80,000
D. G. shoes, clothing, etc., in retail store-----	160,000

DUNLAP BROS.,
By IRA G. DUNLAP.

LETTER OF ARMOUR & CO.

MUSKOGEE, OKLA., November 12, 1915.

DEAR SIR: Confirming our phone conversation to-day, will state that in case the Arkansas River is navigable we can figure on approximately 250,000 pounds by water annually. And in case shipments from Pacific coast can be brought in by way of Panama Canal it would mean a total tonnage of 350,000 pounds annually.

Yours, truly,

ARMOUR & Co.,
O. O. SWARTZ.

Mr. E. D. BEVITT,
Traffic Manager Greater Muskogee Association,
Muskogee, Okla.

LETTER OF SWIFT & CO.

MUSKOGEE, OKLA., November 13, 1915.

GENTLEMEN: Basing our estimate on our October business, would say that it would be possible for us to ship about 1,000,000 pounds of nonperishable products via the proposed Arkansas River route.

Our Chicago shipments during the month in question consisted of two cars of soap, one car evaporated milk, and one car of pickles and condiments.

Yours, respectfully,

SWIFT & Co.

GREATER MUSKOGEE ASSOCIATION,
Traffic Department, Muskogee, Okla.

LETTER OF GRAHAM-SYKES CO.

MUSKOGEE, OKLA., *November 11, 1915.*

DEAR MR. BEVITT: Replying to your request for us to furnish you with information as to the probable amount of tonnage that might be diverted for transportation via Arkansas River, will say that it is difficult for us to determine the exact amount.

In checking our October expense bills, and estimating that month as a fair comparison for the year, we find that shipments that could be diverted via Arkansas River are conservatively estimated at 100 to 150 tons per annum.

Yours, very truly,

GRAHAM-SYKES Co.,
By O. T. GRAHAM.

Mr. E. D. BEVITT,
*Manager Traffic Department Greater Muskogee Association,
Muskogee, Okla.*

LETTER OF PEGRAM DRY GOODS CO.

MUSKOGEE, OKLA., *November 12, 1915.*

GENTLEMEN: We have been interviewed on the subject of the navigation of the Arkansas River, with the request to state the possibility of shipments by water from St. Louis, Chicago, and other points via New Orleans to Muskogee through the Arkansas River. We believe it would be possible for us to ship a great many tons of freight during a year if this navigation were open, providing the rates were sufficiently less to justify such routing. Just how many tons it would be hard to estimate, but we should say in the neighborhood of 100 tons annually.

Trusting this undertaking may be satisfactorily carried out, we remain,

Yours, respectfully,

PEGRAM DRY GOODS Co.,
By T. L. PEGRAM.

GREATER MUSKOGEE ASSOCIATION,
Muskogee, Okla.

LETTER OF NEW PHOENIX CLOTHING CO.

MUSKOGEE, OKLA., *November 12, 1915.*

DEAR SIR: If the Arkansas River was open to navigation it would be possible for us to route about 65 tons per year by the boat line operating thereon.

We trust the improvement of this stream will be carried out and we will be glad to ship every pound that we can that way.

Yours, very truly,

NEW PHOENIX CLOTHING Co.

Mr. E. D. BEVITT,
*Manager Traffic Department Greater Muskogee Association,
Muskogee, Okla.*

LETTER OF WALK-OVER BOOT SHOP.

MUSKOGEE, OKLA., *November 15, 1915.*

DEAR SIR: Our freight from Boston on shoes will run about 18,000 pounds; amount, \$350.80.

Yours, respectfully,

WALK-OVER BOOT SHOP.
J. E. BUEHUSEN.

Mr. E. D. BEVITT,
Muskogee, Okla.

LETTER OF CASH SHOE CO.

MUSKOGEE, OKLA., *November 15, 1915.*

GENTLEMEN: If the Arkansas River were navigable, it would be possible for us to route at least 10 tons per year.

Yours, truly,

CASH SHOE STORE,
By LOUIE D. GRIFFING.

GREATER MUSKOGEE ASSOCIATION,
Muskogee, Okla.

LETTER OF M'KINNEY & REDD.

MUSKOGEE, OKLA., *November 15, 1915.*

GENTLEMEN: If the Arkansas River were navigable, it would be possible for us to ship about 14 tons of freight annually.

McKINNEY & REDD.

GREATER MUSKOGEE ASSOCIATION,
Muskogee, Okla.

LETTER OF HOOKER-HENDRIX HARDWARE CO. (INC.).

MUSKOGEE, OKLA., *November 4, 1915.*

DEAR SIR: In reply to yours of November 3 will say that the approximate estimate of the river tonnage that we would give to the Arkansas River navigation from all points would be at least 1,000 tons for a period of 12 months.

Yours, truly,

HOOKER-HENDRIX HARDWARE Co.,
W. H. HOOKER.

E. D. BEVITT,
Manager Traffic Bureau, Muskogee, Okla.

LETTER OF ATLAS SUPPLY CO.

MUSKOGEE, OKLA., *November 10, 1915.*

DEAR SIR: Replying to your favor of November 3, requesting the approximate amount of tonnage available for transportation based on a commercial proposition, that could be transported by water if navigation was open in the Arkansas River to this point, we have been unable to go into this matter in detail so far as local shipments are concerned, but find in figuring up our carload shipments for Muskogee proper and deliveries in immediate territory that we have handled soil pipe and cast iron first nine months this year about the following tonnage: From Chattanooga, 75 to 100 tons; from Birmingham, 75 to 100 tons; from originating and Pittsburgh district, about 9,500 tons.

All of these figures, as stated above, are based on our records up to and including October.

Trust that this information will answer your purpose, and if necessary will be glad to give you a more detailed statement.

Yours, truly,

J. H. McDONALD,
President.

Mr. E. D. BEVITT,
Traffic Manager Greater Muskogee Association,
Muskogee, Okla.

LETTER OF CRANE CO.

CHICAGO, ILL., *November 9, 1915.*

DEAR SIR: Replying to your letter of the 5th instant. Our business is of such a nature and comes from such points that no very large quantity of it can be handled via the Arkansas River. However, we could give to a line of boats running on the Arkansas in connection with the Mississippi River freight to

the amount of 300 to 325 tons a year. Of course the rates would have to be low enough to justify using boats as against the better and quicker service by the railroad carriers.

Yours, truly,

CRANE Co.,
By O. F. BELL,
Traffic Manager.

Mr. E. D. BEVITT,
Traffic Manager Greater Muskogee Association,
Muskogee, Okla.

LETTER OF L. A. PERKINS HARDWARE CO.

MUSKOGEE, OKLA., November 15, 1915.

DEAR SIR: Replying to your inquiry concerning the amount of tonnage we could give the Arkansas River were that stream opened to navigation, we will say that we could give about 300 tons.

Very truly, yours,

L. A. PERKINS HARDWARE CO.,
By L. A. PERKINS.

Mr. E. D. BEVITT,
Traffic Manager Greater Muskogee Association,
Muskogee, Okla.

LETTER OF OKLAHOMA CORRUGATED STEEL & IRON CO. (INC.).

MUSKOGEE, OKLA., November 11, 1915.

DEAR SIR: Our average yearly tonnage into Muskogee amounts to about 100 tons. If the Arkansas River were navigable, we would gladly route most of this via the river.

Very truly, yours,

OKLAHOMA CORRUGATED STEEL & IRON CO.
H. C. EISENSCHMIDT, Treasurer.

E. D. BEVITT,
Traffic Manager Greater Muskogee Association,
Muskogee, Okla.

LETTER OF SHIRAR & COPELAND.

MUSKOGEE, OKLA., November 12, 1915.

GENTLEMEN: If the Arkansas River were open to navigation, it would be possible for us to route about 125 tons via the river.

We would be very glad to see the river improved, so that we could use it.

Yours, truly,

SHIRAR & COPELAND.

GREATER MUSKOGEE ASSOCIATION,
Muskogee, Okla.

LETTER OF MADDIN-MERCHANT HARDWARE CO.

MUSKOGEE, OKLA., November 12, 1915.

DEAR SIR: Replying to yours of recent date regarding tonnage which could be shipped to us by way of river, we believe a conservative estimate would be about 50 tons per year.

Yours, very truly,

MADDIN-MERCHANT HARDWARE CO.

Mr. E. D. BEVITT, Muskogee, Okla.

LETTER OF THE MUSKOGEE HARDWARE CO. (INC.).

MUSKOGEE, OKLA., November 12, 1915.

DEAR SIR: If the Arkansas River was navigable, it would be possible for us to ship via the boat lines operating thereon about 20 tons per month.

We hope that the improvement of the Arkansas River will not be abandoned, as we regard it as essential to the future development of this country.

Yours, truly,

MUSKOGEE HARDWARE CO.,
By J. T. LANGHMAN,
Secretary-Treasurer.

Mr. E. D. BEVITT,
Traffic Manager Greater Muskogee Association,
Muskogee, Okla.

LETTER OF H. B. DAVIS HARDWARE CO.

MUSKOGEE, OKLA., *November 13, 1915.*

DEAR SIR: Complying with your request for an estimate of the tonnage we could give in the event the Arkansas River was made navigable, I have made estimates on the basis of last year's business and believe that under ordinary conditions we could use such transportation to the amount of 40,000 pounds.

This would consist mostly of wire and steel from the Atlantic coast.

This is, of course, only an estimate, but is as accurate as we could get at it.

Respectfully,

H. B. DAVIS HARDWARE CO.

Mr. W. S. RADAKER,
Secretary Greater Muskogee Association,
Muskogee, Okla.

LETTER OF THE O'CONNOR CO.

MUSKOGEE, OKLA., *November 13, 1915.*

DEAR SIR: Replying to your inquiry as to the amount of tonnage that we could give the Arkansas River were that stream open to navigation, will say that we could give about 360,000 pounds per year.

Very truly, yours,

THE O'CONNOR CO.,
By L. A. CORY, *Secretary.*

Mr. E. D. BEVITT, *Muskogee, Okla.*

LETTER OF CLYDE C. POOLE PLUMBING CO.

MUSKOGEE, OKLA., *November 13, 1915.*

SIR: In reply to your inquiry concerning the amount of tonnage I could give to the Arkansas River were it open to navigation, will say that I could probably furnish 25 tons per year or more.

Respectfully,

CLYDE C. POOLE PLUMBING CO.,
Per CLYDE C. POOLE, *Manager.*

Mr. E. D. BEVITT,
Traffic Manager Greater Muskogee Association,
Muskogee, Okla.

LETTER OF MR. R. B. CRITTENDEN.

MUSKOGEE, OKLA., *November 13, 1915.*

DEAR SIR: Replying to your inquiry as to the amount of tonnage I could give the Arkansas River were it open to navigation and boat lines established, will say that I could route about 5 tons per year by river.

Yours, truly,

R. B. CRITTENDEN.

Mr. E. D. BEVITT,
Traffic Manager Greater Muskogee Association,
Muskogee, Okla.

LETTER OF MR. O. S. FAYLOR.

MUSKOGEE, OKLA., *November 13, 1915.*

GENTLEMEN: I could route something like 2 tons of freight a year if the Arkansas River was navigable and would give us a better freight rate.

Yours, truly,

O. S. FAYLOR.

GREATER MUSKOGEE ASSOCIATION,
Muskogee, Okla.

LETTER OF THORNTON & CO.

MUSKOGEE, OKLA., *November 12, 1915.*

DEAR SIR: If the Arkansas River were navigable, it would be possible for us to ship via the boat lines operating thereon about 25 tons per year.

We regard the navigation of the Arkansas River as of vital importance to the future development of this country.

Yours, truly,

THORNTON & Co.,
By G. W. Cox, *Manager.*

Mr. E. D. BEVITT,
Traffic Manager Greater Muskogee Association,
Muskogee, Okla.

LETTER OF J. W. JENKINS'S SONS MUSIC CO.

KANSAS CITY, Mo., *November 12, 1915.*

DEAR SIR: We note yours of late date. It will be impossible for us to say what goods we could give you at Muskogee excepting we knew at what point the goods could be turned over to the river line and the probable service. If we could depend on a three weeks' service from New York, Boston, or Chicago, it is possible that we could give 150 or 200 tons of business per year. That is about as near as we could come to making you a proposition in the matter.

Yours, sincerely,

J. W. JENKINS'S SONS MUSIC Co.,
J. W. JENKINS, *President.*

Mr. E. D. BEVITT,
Greater Muskogee Association, Muskogee, Okla.

LETTER OF KROH MUSIC CO.

MUSKOGEE, OKLA., *November 15, 1915.*

GENTLEMEN: If the Arkansas River were navigable, it would be possible for us to route about 120 tons per year that way.

Yours, truly,

KROH MUSIC Co.,
By H. A. KROH.

GREATER MUSKOGEE ASSOCIATION,
Muskogee, Okla.

LETTER OF RILEY-HARBOUR FURNITURE CO.

MUSKOGEE, OKLA., *November 11, 1915.*

DEAR SIR: If the Arkansas River were navigable, it would be possible for us to route about 80 tons per annum via boat lines thereon.

We would be glad to see the river improved so that we could ship that way.

Yours, truly,

RILEY-HARBOUR FURNITURE Co.,
By E. F. RILEY.

Mr. E. D. BEVITT,
Traffic Manager Greater Muskogee Association,
Muskogee, Okla.

LETTER OF THE HOUSEHOLD FURNITURE & CARPET CO.

MUSKOGEE, OKLA., *November 13, 1915.*

DEAR SIR: Replying to yours of the 9th instant, with reference to the tonnage on shipments that we will be in a position to give if the river were navigable, wish to say that we feel that our tonnage would run between 75 and 80 tons that we will be in a position to route that way.

We feel that this is a good move and hope to see, some time in the near future, boats running to Muskogee.

Yours, very truly,

T. O. BASS FURNITURE Co.,
T. O. BASS.

Mr. E. D. BEVITT,
Traffic Manager Greater Muskogee Association,
Muskogee, Okla.

LETTER OF STREET EICHOLTZ FURNITURE CO.

MUSKOGEE, OKLA., *November 12, 1915.*

DEAR SIR: In figuring up our freight weights for the past year we find we have received about 195 tons; of course, the greater part of this could be routed via river if shipping facilities were established.

Hoping we have given you the desired information, we are,

Yours, very truly,

STREET EICHOLTZ FURNITURE Co.,
By W. M. EICHOLTZ.

Mr. E. D. BEVITT,
Traffic Manager, Muskogee, Okla.

LETTER OF FERGUSON BROS.

MUSKOGEE, OKLA., *November 11, 1915.*

DEAR SIR: The approximate amount of freight received by us annually is 150 tons.

This may run a little more or a little less. However, we trust this information will be of some value or assistance to you in gathering your data as to the amount of tonnage received in Muskogee.

Yours, truly,

FERGUSON BROS.,
By O. G. FERGUSON.

Mr. E. D. BEVITT,
Traffic Manager Greater Muskogee Association,
Muskogee, Okla.

LETTER OF TODD FURNITURE CO.

MUSKOGEE, OKLA., *November 6, 1915.*

DEAR SIR: Your inquiry of the 5th you ask about what our tonnage would be from Fort Smith and Little Rock. I would say from rate we have been shipping it would run about 40 tons per year. We would buy almost exclusively from these points on a low freight rate.

Respectfully,

TODD FURNITURE Co.,
Per FAY TODD, *Manager.*

Mr. E. D. BEVITT,
Traffic Manager, Muskogee, Okla.

LETTER OF BEWLEY WHOLESALE FURNITURE CO.

MUSKOGEE, OKLA., *November 3, 1915.*

GENTLEMEN: You ask us the amount of tonnage that our freight would amount to which could be handled by way of the Arkansas River. Will say

that the amount of freight that we handle by way of Memphis is but very little, probably 40,000 or 50,000 pounds, or about four cars, annually. However, there would possibly be other goods in our line that we could manage to ship by way of Memphis and the Arkansas River.

Hoping this will be a satisfactory explanation, we remain,

Yours, very truly,

BEWLEY WHOLESALE FURNITURE Co.,
Per L. A. BEWLEY.

GREATER MUSKOGEE ASSOCIATION,
Muskogee, Okla.

LETTER OF MUSKOGEE ELECTRIC CO.

MUSKOGEE, OKLA., *November 12, 1915.*

GENTLEMEN: Replying to your request for the approximate tonnage that we would be able to give for water transportation, provided the Arkansas River were navigable, would say that this would amount to approximately 15 tons per year.

Yours, very truly,

THE MUSKOGEE ELECTRIC Co.,
W. H. STUEVE, *Manager.*

TRAFFIC BUREAU, GREATER MUSKOGEE ASSOCIATION,
Muskogee, Okla.

LETTER OF PEABODY ELECTRIC CO.

MUSKOGEE, OKLA., *November 10, 1915.*

DEAR SIR: We write with reference to possible annual tonnage we could give a reliable water freight service plying the Arkansas River. If such a system were installed we could furnish approximately 50 tons per annum. This is a conservative estimate based on past purchases.

Yours, very truly,

PEABODY ELECTRIC Co.,
A. D. PEABODY, *President.*

Mr. E. D. BEVITT,
Manager Traffic Department, Greater Muskogee Association,
Muskogee, Okla.

LETTER OF BURROUGHS ADDING MACHINE CO.

MUSKOGEE, OKLA., *November 13, 1915.*

DEAR SIR: Replying to your recent inquiry with reference to the tonnage received by this office within a period of 12 months, will state that this will approximate 15 tons out of Detroit and probably 2 or 3 tons out of Chicago.

Trusting this is the information desired, we are

Very truly, yours,

L. V. HITCH, *Sales Manager.*

E. D. BEVITT,
Manager Traffic Bureau, Muskogee, Okla.

LETTER OF PHOENIX OFFICE SUPPLY CO.

MUSKOGEE, OKLA., *November 13, 1915.*

GENTLEMEN: Replying to your inquiry about how much freight we have in-bound that could come via the Arkansas River, we have a little over 2 tons per year, on an average.

Our outbound shipments are all express and would not move by water.

Very truly,

PHOENIX OFFICE SUPPLY Co.,
J. T. WARD, *Manager.*

GREATER MUSKOGEE ASSOCIATION,
Muskogee, Okla.

LETTER OF MODEL PRINTING CO.

MUSKOGEE, OKLA., *November 10, 1915.*

GENTLEMEN: As regards Arkansas River navigation and the tonnage we could throw to the river, we believe we are safe in saying that we could ship via river for so small a business as ours at least 5 tons per year. When business is normal we could increase this very materially.

Yours, very truly.

MODEL PRINTING Co.,
D. E. MELTON.

MUSKOGEE TRAFFIC BUREAU,
Muskogee, Okla.

LETTER OF PHOENIX JOB PRINTING CO.

MUSKOGEE, OKLA., *November 15, 1915.*

GENTLEMEN: Referring to your recent request, we find that if the Arkansas River were navigable it would be possible for us to ship in 15 tons of paper per year by water.

Very truly, yours,

PHOENIX JOB PRINTING Co.,
By TAMS BIXBY, Jr., *Manager.*

GREATER MUSKOGEE ASSOCIATION, TRAFFIC DEPARTMENT,
Muskogee, Okla.

LETTER OF THE STAR PRINTERY.

MUSKOGEE, OKLA., *November 15, 1915.*

SIR: If the Arkansas River is made navigable, our firm's shipments of paper, etc., will not be less than 1 ton annually.

Yours, truly,

THE STAR PRINTERY,
S. B. HUDSON, *Manager.*

Mr. E. D. BEVITT,
Manager Muskogee Traffic Bureau, Muskogee, Okla.

LETTER OF ADLETA PAPER CO.

MUSKOGEE, OKLA., *November 9, 1915.*

DEAR MR. BEVITT: In regard to our tonnage, will say that last year it amounted to about 800,000 pounds, practically all of which could have been routed by water.

Trusting this is the information desired, we remain,

Yours, truly,

ADLETA PAPER Co.,
E. C. ADLETA.

Mr. E. D. BEVITT,
Manager Traffic Department, Greater Muskogee Association,
Muskogee, Okla.

LETTER OF THE MUSKOGEE TIMES-DEMOCRAT.

MUSKOGEE, OKLA., *November 5, 1915.*

DEAR SIR: The Times-Democrat is available for river shipment in the event the Arkansas River is made navigable to the amount of 300 tons of paper per annum and 8,000 pounds of ink per annum. This estimate is based on minimum consumption. Possibly the rest of our freight would come by rail.

Very truly,

MUSKOGEE TIMES-DEMOCRAT,
EUGENE M. KERR, *Publisher.*

Mr. E. D. BEVITT,
Traffic Manager Greater Muskogee Association,
Muskogee, Okla.

LETTER OF PHOENIX PRINTING CO.

MUSKOGEE, OKLA., November 15, 1915.

DEAR SIR: Replying to your letter regarding the tonnage available to us for river transportation, we are pleased to advise you that this company receives annually a little over 300 tons for the newspaper department alone.

Very truly,

MUSKOGEE DAILY PHOENIX,
H.

Mr. E. D. BEVITT,
*Traffic Manager Greater Muskogee Association,
Muskogee, Okla.*

LETTER OF GEO. D. HOPE LUMBER CO.

MUSKOGEE, OKLA., November 15, 1915.

DEAR SIR: Replying to your inquiry as to the amount of tonnage we could route via Arkansas River with river open for navigation, we could at the lowest estimate route 1,300 tons per year this way.

Yours, truly,

GEO. D. HOPE LUMBER CO.,
A. CATLETT.

Mr. E. D. BEVITT,
Traffic Manager Greater Muskogee Association, Muskogee, Okla.

LETTER OF PAGE LUMBER CO.

MUSKOGEE, OKLA., November 12, 1915.

DEAR SIR: We wish to advise you that the average freight weight handled by us in 12 months will amount to 960,000 pounds.

Yours, truly,

PAGE LUMBER CO.,
T. B. PAGE.

Mr. E. D. BEVITT,
Traffic Manager, Muskogee, Okla.

LETTER OF MR. H. E. KETCHAM.

MUSKOGEE, OKLA., November 13, 1915.

GENTLEMEN: Nineteen hundred and fourteen freight receipts at Muskogee 1,051 tons.

H. E. KETCHAM.

GREATER MUSKOGEE ASSOCIATION,
Muskogee, Okla.

LETTER OF MARSHALL LUMBER CO.

MUSKOGEE, OKLA., November 12, 1915.

DEAR SIR: In answer to yours of the 9th instant in regard to the amount of freight handled by us in a year, will say that we handle about 50 cars of approximately 40 tons each, or about 2,000 tons.

Yours, truly,

MARSHALL LUMBER CO.,
Per R. S. MARSHALL.

Mr. E. D. BEVITT,
*Traffic Manager Greater Muskogee Association,
Muskogee, Okla.*

LETTER OF MINNETONKA LUMBER CO.

MUSKOGEE, OKLA., *November 12, 1915.*

DEAR SIR: In reply to your inquiry about the amount of freight that we handle each year, that would be possible to route via the river were it navigable and a boat line operated on same, beg to advise that we handle about 75 cars a year, of 40,000 pounds or more each, and a large portion of this business could be handled by a boat line if the rate was justifiable.

Yours, truly,

MINNETONKA LUMBER Co.,
By C. A. SAMSON.

Mr. E. D. BEVITT,
Traffic Manager, Muskogee, Okla.

LETTER OF THE T. H. ROGERS LUMBER CO. (INC.).

MUSKOGEE, OKLA., *November 12, 1915.*

DEAR-SIRS: In reply to your inquiry of recent date, regarding the shipments received by us, will say that our shipments have been very light for the past two years, averaging about 600 tons per annum. Will say that under normal conditions our shipments will average 1,000 to 1,200 tons per annum.

Yours, very truly,

THE T. H. ROGERS LUMBER Co.,
By G. S. KENNEDY.

GREATER MUSKOGEE ASSOCIATION,
Muskogee, Okla.

LETTER OF MUSKOGEE LUMBER CO.

MUSKOGEE, OKLA., *November 11, 1915.*

GENTLEMEN: Replying to yours of the 9th, beg to advise that our yearly tonnage of freight into Muskogee is about 960 tons. Nearly all of this could be handled via the Arkansas River. We would be very much pleased to see this waterway opened to navigation, as it would mean a large amount of money saved in the matter of freights.

Yours, truly,

MUSKOGEE LUMBER Co.,
By A. F. WORCHESTER, *President.*

GREATER MUSKOGEE ASSOCIATION,
Muskogee, Okla.

LETTER OF J. A. BUTTS LUMBER CO.

MUSKOGEE, OKLA., *November 11, 1915.*

DEAR SIR: We have your inquiry as to how many tons of freight we might handle in a year's time. Will say we will probably ship 60 cars in a year, averaging 35,000 pounds to the car. This might come by river freight, and it might not.

Yours, truly,

J. A. BUTTS LUMBER Co.

E. D. BEVITT,
Traffic Manager, Muskogee, Okla.

LETTER OF STANDARD ROOFING & MATERIAL CO.

MUSKOGEE, OKLA., *November 11, 1915.*

DEAR SIR: Our tonnage at present via the Arkansas River per month would be about 50 tons during present conditions, and during normal conditions would be 125 tons or more.

Yours, very truly,

STANDARD ROOFING & MATERIAL Co.

Mr. E. D. BEVITT,
*Traffic Manager Greater Muskogee Association,
Muskogee, Okla.*

LETTER OF NATIONAL SASH & DOOR CO.

MUSKOGEE, OKLA., *November 11, 1915.*

DEAR SIR: For your information we are pleased to advise our incoming freight amounts to approximately 350 tons per annum, of which amount about 150 tons could be handled via the water route.

Yours, very truly,

NATIONAL SASH & DOOR Co.,
I. B. SANDERS, *Manager.*

Mr. E. D. BEVITT,
Traffic Manager Greater Muskogee Association,
Muskogee, Okla.

LETTER OF THE CRAFT SHOP.

MUSKOGEE, OKLA., *November 13, 1915.*

GENTLEMEN: We feel safe in saying that should the Arkansas River be made navigable we could handle freight to the amount of 2,000 pounds annually.

Respectfully, yours,

THE CRAFT SHOP,
By W. E. BROWN.

GREATER MUSKOGEE ASSOCIATION,
Muskogee, Okla.

LETTER OF A. FABBRO & CO.

MUSKOGEE, OKLA., *November 11, 1915.*

GENTLEMEN: Your letter of the 9th instant received and contents noted. We wish to advise that we use in the course of a year about 200 tons of freight. Trusting that this will help you on the 16th to show that we are the second city of Oklahoma, and some day to be the first.

Yours, truly,

A. FABBRO & Co.,
A. FABBRO.

GREATER MUSKOGEE ASSOCIATION,
Muskogee, Okla.

LETTER OF C. L. DICKMANN GLASS CO.

MUSKOGEE, OKLA., *November 11, 1915.*

DEAR SIR: We wish to advise you that should a proper rate be given us for transportation via the Arkansas River we could have the following material sent this way, basing same on 12 months: Eight carloads of window glass, each car weight about 40,000 pounds, which would originate at New Orleans, Galveston, or some other Gulf point. About 3,000 pounds monthly of plate glass from St. Louis in less-than-carload shipments to Muskogee, besides about 2,000 monthly to other Oklahoma points. About 24,000 pounds annually of rough rolled glass from St. Louis.

This above tonnage is based on a rather quiet year in the building business for this State, and in a prosperous year this would undoubtedly be several times larger.

Yours, very truly,

C. L. DICKMANN GLASS Co.,
By C. L. DICKMANN.

Mr. E. D. BEVITT,
Manager Traffic Bureau, Muskogee, Okla.

LETTER OF THE FARRELL WALL PAPER CO.

MUSKOGEE, OKLA., *November 13, 1915.*

GENTLEMEN: In reply to your inquiry we wish to advise that we could have approximately 50 tons of freight come via water route each year.

Very truly, yours,

THE FARRELL WALL PAPER Co.

GREATER MUSKOGEE ASSOCIATION,
Muskogee, Okla.

LETTER OF MUSKOGEE MARBLE AND GRANITE FINISHING WORKS.

MUSKOGEE, OKLA., *November 15, 1915.*

DEAR SIR: As per your request regarding the amount of tonnage we would be in position to route via Arkansas River if it were open to navigation, we beg to advise that we could be able to route as above to the amount of from 125 to 150 tons per year.

MUSKOGEE MARBLE & GRANITE FINISHING WORKS,
By W. B. BAINBRIDGE, *Manager.*

Mr. E. D. BEVITT,
Muskogee, Okla.

LETTER OF BOCKENHEUSER & CO.

MUSKOGEE, OKLA., *November 15, 1915.*

GENTLEMEN: We quote you our yearly shipments at 6 tons, conservatively, covering white lead, paints, dry colors, and wall papers, which might be routed via the Arkansas River. We are,
Very truly, yours,

BOCKENHEUSER & Co.

GREATER MUSKOGEE ASSOCIATION,
Muskogee, Okla.

LETTER OF MUSKOGEE PAINT & GLASS CO.

MUSKOGEE, OKLA., *November 6, 1915.*

DEAR SIR: In reply to yours of October 29, also of the 6th instant, requesting that we send you a statement giving the amount of tonnage that we could give a boat line, provided that the Arkansas River was opened for navigation, wish to say that we could easily give 100 tons or 200,000 pounds of freight.

The above amount would be shipped from the following cities: Cincinnati, Louisville, Cleveland, Wooster, Chicago, and St. Louis. And, of course, should we be able to make connections with Atlantic seaboard points, especially New York, we could give considerable more to the boat line.

Trusting that the above information will be satisfactory and that we may succeed in getting the boat line and the Arkansas River opened up to navigation, we are,

Very truly, yours,

MUSKOGEE PAINT & GLASS Co.,
By JNO. H. THROCKMORTON, *President.*

Mr. E. D. BEVITT,
Traffic Manager, Muskogee, Okla.

LETTER OF R. E. REED PAINT & WALL PAPER CO.

MUSKOGEE, OKLA., *November 15, 1915.*

GENTLEMEN: If the Arkansas River were navigable it would be possible for me to ship between 35 and 40 tons per year by that route.

Yours, truly,

R. E. REED.

GREATER MUSKOGEE ASSOCIATION,
Muskogee, Okla.

LETTER OF A. HALVERSON CO.

MUSKOGEE, OKLA., *November 15, 1915.*

GENTLEMEN: If there was a water route into Muskogee from northern and eastern cities we would have about 6,000 pounds of freight which would be handled by same each month.

Yours, very truly,

A. HALVERSON Co.,
A. HALVERSON.

GREATER MUSKOGEE ASSOCIATION,
Muskogee, Okla.

LETTER OF CARDINAL DRUG CO.

MUSKOGEE, OKLA., November 11, 1915.

GENTLEMEN: In replying to inquiry as to tonnage which could be routed via Arkansas River route, would state that at a conservative estimate we could guarantee you not less than 1 ton per month.

Yours, very truly,

CARDINAL DRUG CO.,
By W. E. DELEHANT.

GREATER MUSKOGEE ASSOCIATION,
Muskogee, Okla.

LETTER OF H. L. STERN JEWELRY CO.

MUSKOGEE, OKLA., November 12, 1915.

DEAR SIR: If the Arkansas River were navigable it would be possible for me to route about 5 tons of high-class freight that way per year.

Yours, truly,

H. L. STERN.

Mr. E. D. BEVITT,
Traffic Manager Greater Muskogee Association,
Muskogee, Okla.

LETTER OF COHENOUR RYSEL CO.

MUSKOGEE, OKLA., November 13, 1915.

DEAR SIR: In regard to freight which we would have shipped via water route from either Chicago or St. Louis, beg to state it will amount to about 2 tons. Most of it is double first class.

Yours, truly,

COHENOUR RYSEL Co.

Mr. E. D. BEVITT,
Traffic Manager Greater Muskogee Association,
Muskogee, Okla.

LETTER OF THE ROBERTS MATTRESS MANUFACTURING CO.

MUSKOGEE, OKLA., November 10, 1915.

DEAR SIR: Our inbound material amounts now to about 39 tons per month, all of which could be routed via the Arkansas River were that stream navigable. We would be glad to so route it, as we believe that the Arkansas River improvement is essential to the upbuilding of this section of the country.

Yours, truly,

W. E. ROBERTS, *Manager.*

Mr. E. D. BEVITT,
Traffic Manager Greater Muskogee Association,
Muskogee, Okla.

LETTER OF EAGLE HAY PRESS & IMPLEMENT CO.

MUSKOGEE, OKLA., November 9, 1915.

DEAR SIR: Replying to yours of the 6th regarding Arkansas River navigation, would say that we think it no exaggeration to say that if we had regular service on the Arkansas River out of here that we would be able to ship 5 to 10 carloads of goods in the season under present conditions; and as the country would naturally build up, as it surely would with freight service, think we would, in the course of a few years ship many times this amount.

Very truly, yours,

EAGLE HAY PRESS & IMPLEMENT Co.,
By GEO. J. STOUTZ, *President.*

Mr. E. D. BEVITT,
Greater Muskogee Association,
Muskogee, Okla.

LETTER OF EMPIRE FIXTURE WORKS.

MUSKOGEE, OKLA., *November 12, 1915.*

GENTLEMEN: Replying to your request for approximate tonnage that we would be able to give for water transportation, provided the Arkansas River were navigable, would say that this would amount to approximately 70 tons per year.

Yours, very truly,

THE EMPIRE FIXTURE WORKS,
H. P. HERBERT, *Manager.*

TRAFFIC BUREAU,
Greater Muskogee Association.
Muskogee, Okla.

LETTER OF EAGLE BROOM CO.

MUSKOGEE, OKLA., *November 13, 1915.*

DEAR SIR: Following is an estimate of the amount of tonnage that we use per month: Broom corn, 7 tons; material, 2 tons; total, 9 tons.

The material mentioned above could move via the river, as it all comes from St. Louis. In addition, we could ship about 1 ton per month of brooms to down-the-river points.

Yours, truly,

EAGLE BROOM CO.,
By A. L. GILLIAM.

Mr. H. D. BEVITT,
Muskogee, Okla.

LETTER OF MR. J. C. WYNN.

MUSKOGEE, OKLA., *November 13, 1915.*

DEAR SIR: If the Arkansas River were navigable, I could have approximately 10 to 12 cars a year of hardwood shipped that way if the cost of freight would be less than by rail. Minimum cars, 45,000 pounds.

Yours, respectfully,

J. C. WYNN.

Mr. E. D. BEVITT,
Traffic Manager, Muskogee, Okla.

LETTER OF WHEAT'S WOOD WORKER.

MUSKOGEE, OKLA., *November 15, 1915.*

GENTLEMEN: I hereby certify that the probability is that if the Arkansas River was navigable there would be something like 30 to 40 tons in and out over this route for this shop. I am the sole owner, and it is being operated every day.

Very respectfully,

R. W. PARIS.

THE GREATER MUSKOGEE ASSOCIATION,
Muskogee, Okla.

LETTER OF MUSKOGEE IRON WORKS.

MUSKOGEE, OKLA., *November 12, 1915.*

DEAR SIR: Replying to your telephone inquiry will say that our tonnage for the year that could be handled by the water route would amount to about 1,000 tons a year at a conservative estimate.

Yours, very truly,

MUSKOGEE IRON WORKS.
E. R. NALL.

Mr. E. D. BEVITT, *Muskogee Traffic Bureau.*

LETTER OF MUSKOGEE TOOL CO.

MUSKOGEE, OKLA., *November 13, 1915.*

GENTLEMEN: In reply to your letter of recent date requesting to know the amount of freight we received per year that could be handled via rail or water with adequate facilities, would say that we handle on an average 15 cars of iron and steel, weighing approximately 50,000 pounds each. Trusting this is information desired, we beg to remain

Very truly, yours,

THE MUSKOGEE TOOL CO.
H. G. WEAVER.

GREATER MUSKOGEE ASSOCIATION, *Muskogee, Okla.*

LETTER OF O. K. SHEET METAL WORKS.

MUSKOGEE, OKLA., *November 13, 1915.*

GENTLEMEN: In the interest of Arkansas River navigation I wish to advise that we receive approximately 100,000 pounds of sheet metal, roofing, and like products that might well be shipped via the river.

Yours, very truly,

O. K. SHEET METAL WORKS,
By A. C. WRIGHT.

GREATER MUSKOGEE ASSOCIATION, *Muskogee, Okla.*

MUSKOGEE VEHICLE & MACHINERY CO.

MUSKOGEE, OKLA., *November 12, 1915.*

DEAR SIR: Referring to your letter of recent date asking what the probable tonnage would be that we could route via river from eastern points, will say we get about 90 per cent of all of our corn mills, elevator machinery, well drills, and gas engines and steam machinery from points east of the Mississippi River, some of which is handled by ocean steamers to New Orleans, and from there by rail, and I should estimate that we could handle from these points about 300 tons per year under normal conditions.

Yours, very truly,

MUSKOGEE VEHICLE & MACHINERY Co.,
By R. A. LESTER, *President.*

Mr. E. D. BEVITT,
Traffic Manager Greater Muskogee Association,
Muskogee, Okla.

LETTER OF MUSKOGEE CARRIAGE & AUTOMOBILE WORKS.

MUSKOGEE, OKLA., *November 10, 1915.*

DEAR SIR: In answer to your letter of the 9th instant I would say if the Arkansas River would be navigable it would be a great thing to Muskogee.

If the Arkansas River was navigable, I could have most of my freight come by boat. Our freight amounts to about 28 tons per year. And, of course, in a few years the freight will increase considerably, and in 10 years the increase will double.

Hoping the Board of Engineers will pass on it favorably,

Yours, very truly,

MUSKOGEE CARRIAGE & AUTO WORKS,
By F. B. TUTTLIS.

Mr. E. D. BEVITT,
Muskogee, Okla.

LETTER OF OKLAHOMA WAGON WORKS.

DEAR SIR: In our business we use about 40,000 pounds of iron per year, which could be routed via the Arkansas River were that stream navigable.

Yours, truly,

OKLAHOMA WAGON WORKS,
By M. L. REID.

Mr. E. D. BEVITT,
Traffic Manager Greater Muskogee Association,
Muskogee, Okla.

LETTER OF W. R. LANTZ CARRIAGE & AUTOMOBILE WORKS.

MUSKOGEE, OKLA., *November 12, 1915.*

DEAR SIR: In reply to your inquiry as to the amount of freight we handle, wish to state that it will amount to more than 500,000 pounds.

Yours, respectfully,

W. R. LANTZ CARRIAGE & AUTO WORKS,
By W. R. LANTZ.

Mr. E. D. BEVITT,
Traffic Manager, Muskogee, Okla.

LETTER OF SHIPP CIGAR CO.

MUSKOGEE, OKLA., *November 12, 1915.*

GENTLEMEN: In answer to your letter of the 9th will say that we have about 3,000 pounds of freight per year.

Yours, respectfully,

SHIPP CIGAR CO.,
By J. W. SHIPP.

GREATER MUSKOGEE ASSOCIATION,
Muskogee, Okla.

STATEMENT OF GREATER MUSKOGEE ASSOCIATION.

Population of Oklahoma (United States census) : 1890, 258,657 ; 1900, 790,391 ; 1910, 1,657,155.

Principal grains for 1914 : Wheat, 47,975,000 bushels ; corn, 50,000,000 bushels ; oats, 30,250,000 bushels ; barley, 175,000 bushels ; rye, 96,000 bushels ; Irish potatoes, 2,240,000 bushels ; sweet potatoes, 612,000 bushels ; hay, 508,000 tons ; wool, 411,000 pounds. (Yearbook of Department of Agriculture.)

Wheat and corn, Oklahoma.

[Authority Abstract of Thirteenth Census.]

	1907	1908	1909	1910
Wheat.....	8,631,000	15,265,000	15,680,000	25,542,000
Corn.....	113,265,000	122,239,000	101,159,000	91,760,000
	1911.	1912.	1913.	1914.
Wheat.....	8,976,000	20,096,000	17,500,000	47,975,000
Corn.....	36,888,000	101,878,000	52,250,000	50,000,000

Value of all farm property, Oklahoma : 1890, \$12,221,020 ; 1900, \$277,525,433 ; 1910, \$918,198,882. Increase, 1910 over 1900, \$640,673,449. (Authority, Abstract of Thirteenth Census.)

Value of all farm crops, Oklahoma : 1909, \$133,454,405 ; 1899, \$43,759,824. Increase, \$89,694,581. (Authority, Abstract of Thirteenth Census.)

Value of manufactured products, Oklahoma: 1899, \$8,134,000; 1904, \$24,459,000; 1909, \$53,682,000. Increase, 1909 over 1900, \$29,223,000. (Authority, Abstract of Thirteenth Census.)

STATEMENT OF MR. GEO. SENDEL.

The BOARD OF ENGINEERS FOR RIVERS AND HARBORS.

GENTLEMEN: The suspension of navigation on the Arkansas River in the Fort Smith zone has been instrumental in retarding the development of the agricultural and mining interests more than any other factor. The advent of railroads was slow and confined to sections offering the greatest inducements. The course of the Arkansas River is through a most fertile valley, as rich as the valley of the Nile, with more potentialities and, commercially speaking, vastly superior to the river in Africa. I doubt if there is a section in the United States that has developed as rapidly as that section through which this great Nile of America penetrates.

This development has been accomplished without the aid of the Arkansas River or the United States Government. It was materialized through the efforts of the people who looked into the future and were attracted to the great Southwest by the many dormant resources which awaited the coming of up-to-date people, who have built an empire as if by magic, without the assistance of the natural outlet through the Arkansas River.

Since the building of the railroads the attention of our people was diverted from water transportation, and now we realize the great losses sustained by not keeping alive the many advantages of this great artery of trade. In former years, before a railroad was built to Fort Smith, I have seen as many as 12 steamboats at our wharf at one time. Those boats were regular packets between New Orleans, Cincinnati, and St. Louis. We generally had water for boats eight months of the year, and we could always depend on a June rise that lasted several months.

During the period of water navigation up the Arkansas to Fort Smith the National Government came to our relief in keeping the river free of snags which interfered with boating on account of the shifting channels. The river bed was not as wide as now; it was confined to a narrow bed, and with the aid of snag boats and the building of jetties we were quite well cared for. But our great joy in being put in touch with the outside world through the medium of railroads caused a general neglect of the Arkansas River, not only by our people but by the Government, which was but natural.

Now a general awakening throughout the sections along the Arkansas River has aroused our people, and they realize the great loss sustained in the past 35 years of neglect and general indifference to the importance of having navigable water in the Arkansas River. The river bed would cost more than the Panama Canal if it had to be excavated, but nature gave us this great artery of trade and it remains for us to utilize it, confine the water, and again restore navigation, and thereby develop a magnificent section with untold millions of tons of coal, corn, wheat, oats, cotton, lumber, cotton seed, cottonseed oil, and the natural oil found throughout this great section of our country.

Cities have been built where only a few years ago civilization was a cheap commodity, and agricultural development was practically unknown.

We beg to state that the question of transportation to and from the seaboard has become of vital importance to the future development of this country, especially in handling bulky and heavy freights, more especially those shipped to and from foreign ports, where time in transit is of no great importance.

We call attention to the fact that the Arkansas River is one of the longest great waterways of the United States, draining the watershed of about 189,000 square miles, embracing a great part of the States of Missouri, Kansas, Colorado, Arkansas, New Mexico, and Oklahoma, an area of country that is as rich in natural resources as any in the United States, which is now more rapidly filling up with an enterprising population and in which all the lines of productive industry are springing up at a more rapid rate than any other part of the country.

While this territory is blessed with facilities for rapid transportation by the many railroads which have within the last few years been built and are now traversing it, still the question of low freight rates for the great amount of heavy and bulky freights now produced for export is one that must be solved soon if this country is to continue present progress in development.

Water transportation is the only way in which the heavy cheap products can find markets that will justify shipment, and that the Arkansas River is the natural, great interstate highway from the interior to the seaboard and southwest and foreign ports, and, if properly improved, is available for this purpose the year around from Wichita, Kans., to the mouth. And, as part of this, we beg to call attention to Document No. 90, House of Representatives, first session, Forty-ninth Congress, wherein H. S. Tabor, captain of Engineers, in his report upon the survey made of the Arkansas River from Wichita, Kans., to Fort Gibson, under date of February 18, 1886, uses the following language:

"There is no doubt but that a channel can be provided wherever the development of the country warrants it, and the river should be, for all purposes of law, rated as navigable to Wichita, Kans."

In a letter from the late William L. Sibert, captain of Engineers, dated Little Rock, Ark., December 5, 1896, he said:

"In reply to your request for information concerning the improvement of the Arkansas River, will submit the following:

"The present project was adopted from the mouth of the river to Little Rock in 1886, and extended from Little Rock to Wichita, Kans., to 1888, and is: 'To remove rock and gravel reefs by blasting and dredging, to contract the channel by dikes or dams, permeable or solid, of such construction as the local conditions require, and to hold the channel so obtained by revetment where necessary from the mouth to Wichita, Kans., the object being to obtain a channel depth of 6 feet from Little Rock to the mouth and one of 2 feet above Little Rock at low water.'

"Work of the character contemplated in the approved project, in a river like the Arkansas, in general does not produce the full effect hoped for until the work of improvement is continuous over a certain reach of river. The work done in previous years has been so scattered that only local improvements have resulted. There has been no increase of depth for a length of river sufficient for a steamboat trade.

"The amounts appropriated for the different reaches of river have been so small in comparison with the amount necessary to accomplish the work proposed in project in that reach, that it has been impracticable to carry the work on systematically over a reach of river of sufficient length to be of any practicable benefit to navigation other than the maintaining of the channel through the draw spans of bridges.

"The work done, however, if no great changes occur before money is available in sufficient quantity to carry on the work to advantage, will form a part of a complete system." (See Annual Report, Chief Engineers, 1896.)

The question as to whether the commerce developed would justify the expenditure, is one upon which I can not express an opinion. This is the phase of the question that should be investigated by the convention.

That a systematic regulation of the river from its mouth to the mouth of the Canadian would increase the channel depths, I have no doubt; just how great a depth can be made and maintained can only be told after a trial reach has been systematically improved. A systematic regulation of the channel will prevent the caving of the valuable farming lands, and will make levees in the lower river permanent, and will reduce largely the necessity for snagging operations.

Perhaps it will be interesting to know how well we have accomplished developments in the Fort Smith zone without water transportation owing to the practical abandonment of the river by the National Government.

Sebastian County produces, every year, over 2,000,000 tons of coal, and the eastern portion of Oklahoma, tributary to water, produces the same amount and that section, as well as our own, is in its infancy in coal production. If the Arkansas River could be commercially utilized, the output of coal would be doubled and barged down the river, supplying all river towns down to New Orleans.

All the Mississippi ports depend on coal from Pennsylvania on account of water transportation all through the year. Arkansas coal is equal to the Pennsylvania coal, and much of our coal being smokeless is superior, and would find a ready sale if water transportation would be given us. The smokeless coal of Sebastian County would be used by our Navy if we could meet water transportation to tidewater. The smokeless character of our coal will

be a factor in naval activities when the United States adopts preparedness for protection from unforeseen conditions and we of the interior are linked in bonds of financial and commercial relations with the seaboard cities which appeal to us, and we rejoice that we would not only contribute men but smokeless coal in defense of our Nation.

Ten per cent of all the hardwood in the world is in Arkansas. Much of this valuable asset is shipped out of our State in the raw state and manufactured into the finished product in other States. This raw material is shipped out of our State by rail in order that the lowest freight rate will be obtained. Water competition would induce factories to be established in our State.

We have a wagon factory in Fort Smith with an annual capacity of 15,000 jobs, the weight of this output being 15,000,000 pounds. It requires 600 cars of 25 wagons each to handle this annual output. We manufacture every year 1,500 carloads of finished furniture, which is shipped in every direction.

We manufacture coal-shovel handles in Fort Smith for the English mines and ship them to New York by rail for export instead of down the Arkansas and Mississippi rivers to tidewater. What a wonderful saving to our city and manufacturer if water transportation was available.

The largest sorghum-sirup mill in the world is located in Fort Smith, and they have just finished their season's run and have now stored in their mammoth tanks 150,000 gallons of finished sirup, which is awaiting shipment to St. Louis to be reduced to commercial packages. Water transportation would reduce the freight rate and increase the price for the raw material.

These 150,000 gallons of sirup will be increased from year to year, bringing a new crop into commercial importance and adding another element into the diversified agricultural development of our section. This industry is very new, this being its second season, and consumed the cane produced on 2,000 acres of land.

This sirup mill has a capacity of 5,000 acres of cane and will reach that limit within two or three years. This year's output will require 90 cars to transport the sirup. The weight of the sirup amounts to 1,800,000 pounds.

When we reflect that only 15 per cent of the land in Arkansas is under fence and the immense products marketed from this small development, it shows a wonderful development awaits us and that a great State is coming into its own. If our waterways are conserved and made navigable Arkansas will be the richest State in the Union in her natural resources being developed.

In the investigations of the rivers of Arkansas I have considered the State's production and how much greater our showing would be if the great arteries of trade in our State received the aid necessary to develop the thousands of acres now dormant on account of no transportation except the primitive transportation of the wagon to the distant railroads. Miles and miles of rivers flow leisurely down their course through fertile valleys too far removed from railroads and with no river transportation, from which the magic touch of the farmer is withheld and attracted to other States less favored in climate and productivity, but geographically in the zone of greater commercial activities, and consequently is better able to secure recognition from the National Government than this great State receives.

Permit me to give you Arkansas summarized statistically, which may surprise you, and, I hope, will aid you in determining your action in bringing into existence again an almost forgotten source of wealth-producing element that should be redeemed and not abandoned. The countries of Europe spend more money in building canals than we spend to protect our natural waterways, yet the railroads are owned by the governments of Europe, and the waterways that are built, as well as the rivers, enter into competition with each other, thereby creating industrial wealth and developing patriotism in her people. No better evidence is needed than existing conditions over the sea.

Arkansas begs to give you the following statistics, which can easily be verified, and upon closer investigation will go beyond these figures, as many did not reply to our inquiries. I am giving you comparative statements. In 1880, fifteen years after the Civil War, Arkansas again began the development so ruthlessly stopped in 1861; consequently I will give you our statistics in 1880, compared with 1914.

	1880	1914
Population.....	802,525	1,624,000
Manufactures:		
Capital.....	\$2,953,000	\$70,174,000
Products, value.....	\$6,765,000	\$74,916,000
Cotton mills:		
Spindles active.....	2,015	7,090
Looms active.....	28	164
Cotton used, pounds.....	340,000	4,544,264
Cottonseed oil mills, products.....	\$590,000	\$7,700,000
Lumber cut, feet.....	172,503,000	1,777,303,000
Improved farm lands, acres.....	3,595,603	8,052,000
Farm lands, buildings, value.....	\$74,749,655	\$308,129,000
Agricultural products, value.....	\$43,796,000	\$168,375,000
Cotton crop, running bales.....	608,256	846,000
Grain, bushels:		
Corn.....	32,350,000	52,163,000
Oats.....	2,749,000	3,463,000
Live stock:		
Cattle.....	682,000	942,000
Sheep.....	247,000	134,000
Swine.....	1,565,000	1,738,000
Mineral products, value.....	\$65,535	\$5,600,000
Coal mined, tons.....	14,778	3,500,000
Railroad mileage.....	859	5,230
National banks:		
Resources.....	\$779,491	\$36,997,000
Capital.....	\$205,000	\$5,035,000
Individual deposits.....	\$265,382	\$18,785,000
Other banks, deposits.....	\$577,628	\$32,106,521
Common school expenditures.....	\$287,056	\$3,187,000
Property, true value.....	\$286,000,000	\$971,000,000

If the Arkansas River is redeemed, the several cities along its banks will liberally patronize the boats that will again ply that great artery, and local enterprise will assert itself and own boats to relieve congested tonnage and give employment to thousands of people and develop thousands of fertile lands now idle.

Our commercial organization stands ready to render you any assistance in determining your report, and respectfully invites you to visit our city and section so we may personally show you what awaits water transportation in the richest zone along the great Nile of America, the Arkansas River.

Near Fort Smith great veins of coal are seen projecting from the banks of the Arkansas and Poteau Rivers, but not mined on account of no water transportation. This great source of wealth would be developed if we had water in the Arkansas River and supply the cities and towns along its banks as well as Mississippi and Louisiana with cheap fuel.

On behalf of our people, I beg to thank you for this opportunity and your visit to our State.

GEO. SENDEL,
Secretary Business Men's Club,
Fort Smith, Ark.

STATEMENT OF MR. JAMES P. HOYE.

The BOARD OF ENGINEERS FOR RIVERS AND HARBORS.

GENTLEMEN: I would respectfully ask your kind indulgence to listen to a few facts in connection with the coal industry of Arkansas and a part of Oklahoma, with reference to its past and present status and its prospective with river transportation established.

According to Mr. Parker, of the U. S. Government Geological Survey, every coal-producing State in the Union has in the last 10 years increased their coal production several hundred per cent save and except Arkansas, which State was producing more tonnage 10 years ago than it is to-day.

You might well ask why should such an abnormal condition exist. Are the coal fields becoming exhausted? Is the quality of the coal inferior to the coal mined in other States? There must be a reason for this condition and also a remedy. Yes; there are several reasons, and as I view it (and I have had more than 20 years' experience in coal mining in Arkansas and Oklahoma) only one remedy.

In answer to the first query, I will say the coal fields of Arkansas are not only not near exhaustion but have hardly been scratched.

With reference to the second, I will say the United States Government analysis shows that the Arkansas coal is superior to any other coal mined in the United States outside of the Pennsylvania anthracite field. Very high in fixed carbon, low in ash, moisture, and sulphur.

Take the map of the United States and note the geographical position of Arkansas. It is bounded on the east by the Mississippi River, the south by Louisiana and Texas, the west by Oklahoma, and on the north by Missouri.

The States of Louisiana and Texas have practically no coal and should be the legitimate market for the Arkansas product, but on account of the vast amount of oil and gas discovered and produced in Louisiana, Texas, and Oklahoma they supplanted the Arkansas coal and forced it to find another market farther from home. It could not go east to Memphis, on account of the cheaper water rates established at that point. To find any market at all it had to go north and compete in the Kansas and Nebraska markets with Kansas, Missouri, and Iowa coal, each of them having a very decided advantage in freight rates. Take the Kansas City market as an illustration. It costs the Cherokee and Crawford County (Kans.) operators 75 cents per ton to ship coal to Kansas City, while it costs the Arkansas operators \$2 per ton—the same differential exists at all other competitive points. On account of this great handicap the Arkansas mines could not get a fair proportion of the business and are, in consequence, idle a great portion of the time. There has been no new development in the Arkansas fields in recent years.

Several million dollars are invested in coal properties in this State and, in discussing the coal situation with several very prominent Arkansas operators, we all thought that upon the completion of the Panama Canal and the Arkansas River opened to navigation that the future would be full of promise for the coal industry of the State, inasmuch as we never expect the freight rates to be reduced to meet the Kansas rate, and the oil and gas production is constantly growing, there is no salvation for the coal industry of Arkansas other than an outlet to New Orleans and the Gulf via the Arkansas River, and operators would be almost compelled to equip for river transportation, and would do so gladly.

The above statement is not guesswork; I know whereof I speak.

Three years ago, simply on the assurance that the Government had appropriated \$600,000 to build dredge boats to keep a channel open in the river, the late and lamented ex-United States Senator W. M. Kavanaugh and myself interested the Hon. John C. C. Mayo, of Kentucky, a multimillionaire (who made his millions in coal), in organizing a large operating company to ship coal on a large scale to New Orleans and the Panama Canal. When the plans were practically matured and the time set for me to commence acquiring from fifty to sixty thousand acres in Arkansas, Mr. Mayo was stricken and taken to a sanitarium in Cincinnati, lingered several months, and died; and our plans fell through. Mr. Mayo was farsighted and could see that it would be a paying proposition to operate mines in Arkansas if he could ship by water.

I have made arrangements in connection with Mr. G. O. Patterson, a prominent attorney of Clarksville, this State, to organize a coal company in Logan County, Ark. We have secured an option on 500 acres of coal land lying on Cane Creek, on which land we intend to open a mine, equipped to load coal in barges as well as in railroad cars. Our site is ideal, about three-fourths mile from mouth of creek, which is deep and, with little dredging, can be made a fine loading place and harbor.

We expect to be able to load 500 tons per day in one year from sinking shaft. We would have had the shaft sunk by this time were it not for the fact that a Government official in connection with river work stated that the Government was contemplating abandoning the Arkansas River. We decided then to await results.

If the Arkansas is made navigable for at least eight months in the year, we can and will load and ship not less than 50,000 tons per annum by river.

Other operators and owners of coal lands will in self-defense be compelled to either quit mining or find another outlet or market.

An absolutely sure and steady market is assured when New Orleans and Gulf points are reached by barges. New Orleans alone, to say nothing of other Mississippi River points, could, and would, use most of the coal produced from the Arkansas River mines, could we only reach them by water. It is impossible to supply them now on account of freight rates. The rate from here to New

Orleans by rail is \$2.95 per ton. We could easily reach that market by river if we could load our coal in barges. We could ship coal there for less than 75 cents per ton. Western Pennsylvania ships millions of bushels of coal from the Allegheny and Monongahela coal fields to Memphis and New Orleans, which is used by those cities or distributed from them to inland points. We are fully 700 miles nearer and have here in Arkansas and on the tributaries of the Arkansas River boundless forests of pine to build our barges in which to carry our coal.

A description of the coal fields lying along and adjacent to the Arkansas River between Little Rock and Muskogee may be of interest to your honorable board.

In going up the river the first coal field we find is the Russellville field, situated between Russellville and Dardanelle, and described in Branner's Geological Report as the "Shinn Basin," comprising approximately 3,000 acres of anthracite coal. This vein ranges from 32 to 36 inches in thickness and is sold in direct competition with the Pennsylvania anthracite; it is crushed and sized the same as the latter; made into "grate," "egg," "stove," "4," "nut," "pea," "chestnut," and "black." There are two coal companies operating mines and producing about 400 tons per day during their shipping season, their capacity being much larger, however. Those mines are not quite 2 miles from the river. The coal is all being shipped by the railroad, nearly all of it going north and west; none of it goes to Memphis or New Orleans or Mississippi River points, on account of the freight rates, the Pennsylvania coal being shipped there in barges by river.

West of Russellville 3 miles we find another coal, known as the "Ouita Basin." This vein is 28 inches in thickness—an anthracite coal conceded to be the best between Pennsylvania and Colorado. The Ouita Anthracite Coal Co. are operating a mine producing 50 tons per day. The Ouita Basin extends within about 2 miles of the river and is on the Illinois Bayou. There are approximately 2,500 acres of developed and proven coal in this field. The Shinn Basin and Ouita Basin are located just 75 miles by rail west of Little Rock.

The next coal we find up the river is what is known as the "Spadra" field. This is situated 105 miles west of Little Rock. This is also a high-grade coal, known as anthracite, and is sold and used as such, and is rapidly supplanting the Pennsylvania anthracite wherever introduced. This vein ranges in thickness from 3 feet to 46 inches on the north side of the river and from 34 to 64 inches on the south side. On the north side of the river the Spadra field contains approximately 14,000 acres, and coal is now being mined by 12 different coal companies, the majority of which have modernly equipped plants, costing from \$50,000 to \$200,000, and have a producing capacity of more than 500,000 tons annually. A fine loading place and harbor for barges can be made at Spadra or at the mouth of the Spadra Creek. On the south side of the river, in Logan County, the Arkansas Anthracite Coal Co. owns nearly 16,000 acres of this same coal. They own fully 10 miles of river front. This entire tract has been fully prospected and the coal lies under the river the entire 10 miles, and according to the records of the drill holes show the vein to range from 34 to 64 inches, the thickest coal being along the river front and adjacent. There are no mines in operation in the field, for the reasons that there is as yet no means of transportation, except by rail, and the prohibitive freight rates to the north, as before stated.

The Navy Department has made tests of this coal which, I understand, was highly satisfactory. It is absolutely smokeless, and carries from 78 to 83 per cent fixed carbon; it is low in moisture, ash, and sulphur. There are fully 100,000,000 tons of coal to mine in this field. A good loading place and harbor for barges can be made for this field also at the mouth of Cane Creek. This is known as the "Prairie View" field.

About 12 or 15 miles farther west we come to the "Denning" field. This is a different vein of coal to either of the others heretofore mentioned. It is an exceptionally high grade of bituminous coal, ranging from 76 to 78 per cent fixed carbon; is smokeless and is unexcelled as a steam producer, ranks in the Government fuel tests with the celebrated "Pocahontas" coal. This vein is thicker than the others, ranging from 3 feet and 10 inches to 5 feet in thickness. This coal field extends along the river several miles and has approximately 3,000 acres in it.

Across the river on the south side is what is known as the "Paris" field. Several mines are in operation; they are about 5 or 6 miles from the river.

This is also a high-grade coal, the vein being 32 inches in thickness. The Paris operators have to ship their coal 46 miles west to Fort Smith, and then bring it back that distance to get it to Little Rock or any central or eastern part of the State. There are about 4,000 acres in this field.

Next we come to the Sebastian County coal field. This is by far the largest coal field in the State and produces about 70 per cent of the tonnage of the State. The Sebastian County coal is the same grade as the Franklin and Johnson County coal. A very fine harbor and loading place can be made, I am informed, at the mouth of Vache Grasse Creek. The Vache Grasse Valley is all underlaid with coal, some of the largest mines in the State being in that territory, viz, "Jenny Lind" and "Greenwood," there being not less than 35,000 acres of good workable coal in that district accessible to the river by tram. This Greenwood district coal will average 5 feet in thickness, or an approximate total of 175,000,000 tons.

I do not include in the above the whole of the Sebastian County field; only that part that would be close enough to the Arkansas River to justify hauling from mine to river tipple.

Next we come to Fort Smith, where the Poteau River empties into the Arkansas. I am more or less familiar with loading coal in barges. I have lived on streams that were utilized for barging coal, and I firmly believe it will be a very small job to make the Poteau River navigable for barges the whole year round, at least as far as the city of Poteau, which is in the heart of eastern Oklahoma coal field. I have been up the Poteau several miles in a motor boat. This is also a very high grade of bituminous coal. There are a number of mines in operation in this field and the acreage is vast, as the coal field is continuous for fully 40 miles west of Poteau, with a width from north to south of about 30 miles, and the land carries on a good portion of this area three veins of good workable coal. The tonnage is enormous.

Oklahoma is handicapped in its coal development by the same causes as Arkansas, but in a lesser degree. She needs an outlet, and the Poteau and Arkansas Rivers can supply it.

To sum up, we have in the proven and working coal fields enumerated the following coal acreages and possible tonnage:

	Acre.
Shinn Basin.....	3, 000
Ouita Basin	2, 500
Spadra Basin (north side of river).....	14, 000
Prairie View (south side of river).....	20, 000
Denning	3, 000
Paris.....	4, 000
Sebastian.....	35, 000
Eastern Oklahoma	50, 000
Approximate total	131, 000

The present production is nearly as follows:

	Tons.
Russellville, about	60, 000
Ouita, about.....	15, 000
Spadra, about	200, 000
Denning, about	175, 000
Paris, about	20, 000
Sebastian, about	350, 000
Eastern Oklahoma, about.....	150, 000
Approximate total	960, 000

It is very conservative to place the available coal tonnage of the fields named at 800,000,000 tons, and while our annual production is only about 900,000 tons the mines in operation have the necessary equipment and capacity to produce 2,000,000 tons per annum, and it is safe to predict that the present equipped mines would produce fully that amount had they the advantage of river transportation, for the reason that under existing conditions the mines of this territory are practically located so that their legitimate market is cut in two, inasmuch as Memphis and all the Mississippi River points have the benefit of water rates, with which we can not compete.

If river transportation was an assured fact, a number of the present coal companies would hail with delight the opportunity to ship their coal in barges

to New Orleans and other river and Gulf points. It would also be an inducement for new coal companies to open up mines for river shipments.

I venture the prediction that if the Arkansas River is made navigable that in less than 10 years more coal will be shipped in barges on the river than is now produced and hauled by rail in the entire State of Arkansas.

I have been 20 years in the coal fields of Arkansas—as mine foreman at Denning 2½ years, superintendent of W. C. & M. Co. mines at “Jenny Lind” between 5 and 6 years, general manager of the Ouita Anthracite Coal Co. 6 years, and have leased and operated mines for several years past. I have had charge of mines in Oklahoma and Missouri before coming to Arkansas. The last two years I have not been engaged in coal mining, but would be only too glad to re-engage if I could ship by river.

Very respectfully,

JAMES P. HOYE.

STATEMENT OF MR. CARL J. BAER, SECRETARY OF THE LITTLE ROCK CHAMBER OF COMMERCE, AND THE ARKANSAS RIVER IMPROVEMENT ASSOCIATION.

NOVEMBER 16, 1915.

The BOARD OF ENGINEERS FOR RIVERS AND HARBORS.

GENTLEMEN: For the past four years I have made a thorough study of the conditions existing along the Arkansas River and of boats used in navigating shallow streams.

Last year the chamber of commerce placed the steamer *Golden Fleece* on the river to make regular weekly trips between Memphis and the city of Little Rock. This boat operated over a period of five months, and was compelled to withdraw from the river on account of snags and sandbars making it impossible to continue navigating to Little Rock. We have complete cost sheets, showing cost of operating this boat, which enables us to make comparisons in costs of operating other boats.

A special trip was made by the writer throughout the United States to the following rivers: The Savannah, Ocmulgee, and Chattahoochee in Georgia; the Tombigbee, Warrior, and Alabama in Alabama; the Red, Ouachita, and White in Arkansas; the Missouri at Kansas City; the Kanawha, Monongahela, and Allegheny in West Virginia and Pennsylvania; and the Ohio along its entire length for the purpose of studying conditions on these rivers, and particularly studying the type of boats used on inland waters.

Type of boats.—In the past half century there has been practically no improvement in the methods of operating the old type of steamboat. It still has the expensive type of slide-valve engine, the usage of muddy water in the boilers, the heavy fuel expense in the purification of water for boilers, the abnormal weight of the wheels, boilers, engines, cabins, decks, and its heavy wooden construction. Marine engineers are now giving a great deal of consideration to the modern steel constructed self-propelled barge with watertight bulkheads equipped with modern oil, gas, or superheated steam engines, using the open propeller wheel in deep water and the tunnel type wheel in shallow water.

Up to the present time, to my knowledge, there are 10 self-propelled shallow-water barges in use on inland rivers, nearly all of which barges were equipped for usage in still water or slow-moving streams.

The several barges owned by the Alabama Transportation Company, used in the Bourne Canal and in the vicinity of New Orleans, were built by Engineer Bernhard. Some of these boats are carrying self-gas producer engines and are heavier than the oil or superheated-steam equipment. One boat on the Savannah River, and one on the Ocmulgee River in Georgia, has been built with the tunnel type wheel equipment to carry 250 to 300 bales of cotton on 36 inches of water; the boats being 130 feet long by 28 feet beam. The average fuel cost per hour for the running of this type of boat is 26 cents. The number of men necessary to man this boat is five on a single run of 12 hours and nine on a double run of 24 hours.

The Kansas City Navigation Co. has three towboats, two of which are equipped with the tunnel type wheel, but both are makeshifts, being old, steel-bottomed boats with the tunnels built in the boat to the best advantage. These boats are doing splendid work, and many important tests have been made, which will enable the engineers in charge to materially improve construction in all new boats built.

One tunnel type boat in operation now at Charleston, W. Va., and owned by the Government, has proved a success. The Inland Navigation Co., have about completed a modern steel barge, now at Jeffersonville, Ind., over 200 feet in length, with water-tight bulkheads, and four propeller wheels, each equipped with 100-horsepower oil engines.

The building of the modern steel craft for inland waterways is, of course, yet in its experimental stage, but sufficient results have been obtained by the usage of the self-propelled barges to warrant a most thorough investigation on the part of the business man who contemplates navigating in shallow inland streams. The power barges are also used as towboats in most instances, the Kansas City (Mo.) Navigation Co. towing one or two barges on each trip.

The marine insurance rate on the steel craft has been very materially reduced and now stands at about 3 or 4 per cent.

I am quite positive on the Arkansas River we can equip a towboat and barges to carry a sufficient amount of tonnage against the flow of the stream to make a profit. The down-river pull without question shows a handsome profits even by the utilization of the old type of boat, but the old-style barges used on Ohio and Mississippi Rivers in carrying West Virginia coal have scarcely ever hauled any freight on the return trip upstream. A test made on the Mississippi River in the summer of 1914 by Mr. Bernhard showed the average time up the river with 1,000 tons to be less than 3 miles per hour, but this boat, over 200 feet long, was only equipped with two 75-horsepower self-gas-producing engines, and it was the first boat of its kind ever placed on the Mississippi River, and was built for still water, and, of course, was underpowered for upstream navigation.

The success of the Kansas City (Mo.) Navigation Co. is well known to this board, as I understand a full and complete history of the proposition has been submitted to you.

The difficulty in navigating a swift-flowing stream with the acute bends, such as in the Arkansas River, is in guiding the boat around the bends, and unless a boat of the old type can obtain sufficient momentum upstream or is moving at a certain speed, the action of the rudder or steering device is almost nil, but with the modern steel craft equipped with two or three propeller wheels, the wheel on one side of the boat can be propelled forward and on the other side reversed, thereby enabling perfect control of the boat and protecting her from striking the bank.

There is no question, however, in the minds of the engineers as to the propelling force of the old stern wheel. The thrust of the wheel with its paddle directly against the water gives remarkable efficiency in propelling, but the fuel cost of operation of the old-type boat with its stern wheel is far in excess of the fuel cost of the modern type of boat. To explain this exorbitant cost of the old-type paddle wheel, I will refer to a paper recently read before the Association of Marine Engineers in New York by Mr. R. C. Wilson, a marine engineer of New Orleans. He proved by test that the old paddle-wheel boat in 18 feet of water, with its wheel running 30 revolutions a minute, carrying a certain amount of steamhead, would slow up to about 15 revolutions a minute when the boat was running in 7 feet of water. The schedule showed in this report as follows:

The boat running in 18 feet of water, gradually going into a lesser depth of water, the revolutions were diminished by the following proportions:

About $1\frac{1}{2}$ revolutions to each foot of decrease in the depth of the stream, thereby decreasing the speed of the boat proportionately, and the cost of fuel remaining the same.

In this test the steamhead and all other conditions remained the same in the deep and shallow water. This proves conclusively that where this type of boat is compelled to operate in shallow water, that the cost of fuel in operating is materially more than the cost of operation of a propeller wheel not affected by the shallowness of the stream.

All old steamboat men know too well the old sign of the shaking of the boat as shallow water is approached, and the speed of the boat thereby immediately checked. Mr. Wilson figures this is one of the causes of the shallow-river boat of the old type being more expensive to operate than the propeller wheel. The objections to the propeller wheel are, of course, the obstacles such as snags and sand bars coming in contact with the wheel and the consequent injury of the wheel. This, however, has been partially overcome by the invention of the tunnel-type boat where the wheel is in a tunnel and approximately only 60 per cent submerged when the boat is standing still. The movement of the wheel

when running lifts the water from in front through the tunnel covering the wheel, permitting it to be propelled in the water it gathers by propulsion, throwing behind the boat a stream of water approximately as large as the diameter of the wheel, thereby pushing the boat forward. This wheel also acts to a limited degree as a dredging or washing device for the removal of sand bars and crossings.

Dredging and snagging.—The many long stretches of several miles each of deep water in the Arkansas River even during the summer months make navigation of this river more feasible, and we are thereby only confronted with the necessity of opening up the crossings to complete a navigable stream. Many of these crossings are extremely short and can be quickly cut by small boats, giving a temporary and narrow channel.

If your honorable body could devise ways and means to control the filling up of the channel of this river at the worst crossings, either by dikes or jetties and some revetment work of the banks at these points, together with several economic dredge boats for keeping the crossings open, this appears to me a more feasible plan than that of one or two expensive dredge boats which are materially limited in the territory they can cover, using the present large dredges to make permanent wide channels at points where the revetment and other permanent work has been completed. Mechanical devices have also been invented in the form of hydraulic jacks to spar boats off of sandbars, which will enable the new modern steel craft to pass the crossings with far less difficulty and less dredging work than ever before. The details and plans of this device will be submitted to your honorable body if desired.

It has been brought to our attention that the two dredge boats which have recently been placed on this river by the Board of Engineers are absolutely impractical devices to be used in clearing the channel, it being stated they are too expensive, considering the number of months they can operate during the year, as they are only used in the low-water season. If this is correct, I again request of your honorable body that some device more economically operated and less costly in its construction be placed on this river to keep these crossings open, and that the present dredges be used to do that work which can not be done by the smaller and less expensive device. In this connection it has been proven that a small boat with a propeller wheel, or even a paddle wheel manned by a few men and stationed at a crossing, can materially deepen the channel and cut the crossings, after the river has fallen to its lowest stage, by anchoring the boat with wheel toward crossing and washing the sand by propulsion of the wheel; also equipping snag boats with some steam shovel or dipping device to be used on short crossings, thereby saving extra dredging equipment and also saving of time in the larger boats being taken to short crossings at a great distance away.

If this experience of the old river men is correct, and crossings can be cut by smaller boats, why not place upon this river in connection with the present equipment during the coming two or three years several small boats and make the experiment?

The Arkansas River is termed by some engineers as being in a class by itself. If this is true, and the action of this river is unlike other rivers, then it is up to the Government to make different experiments and to utilize different devices than now in use on other rivers.

Freight rates.—The tonnage we have submitted to you to-day from along the Arkansas River is sufficient evidence that the public is vitally interested in the improvement of this river, and the freight-rate situation which has been submitted to this board, showing an absolute discrimination to the towns along this river is sufficient in itself to warrant the most careful consideration of your honorable body. The freight table as submitted on commodities from St. Louis, Louisville, Cincinnati, Nashville, Pittsburgh, Chicago, and New Orleans to Memphis and Little Rock proves conclusively this gross discrimination. In my opinion the only way to obtain redress is by permanent river navigation and the establishment of a permanent common carrier to haul this freight to the Mississippi River points at a rate lower than the railroads are charging and to continue hauling by river, thereby opening up a large territory of undeveloped country and coal mines, which will never be opened until river transportation is provided.

Notice also the division received by the railroads west of Memphis and south of St. Louis in comparison to the division of the freight received by the eastern roads, and you will see on its face gross discrimination to points west of the Mississippi River.

If the Ouachita River improvement is completed to Camden with one more dam and the White River is made navigable and the Arkansas River materially improved, the entire freight fabric in the States of Arkansas and Oklahoma will be materially changed, as these three rivers cover sufficient territory of the entire State to make it possible on a short local rail haul in the State for nearly all towns within the State to reach and use these rivers. The agricultural development in Arkansas to-day is impaired on account of the freight fabric on interstate shipments, and grain can not be moved out of this State on an equal rate basis with other sister States.

It is important that a thorough analysis of this freight fabric be made and taken into consideration by your honorable body. Let me here refer you to Exhibits N-1-4, attached hereto, showing particularly that the first-class rate from St. Louis to Little Rock, a distance of 365 miles, is \$1, as against a rate from New York to St. Louis, a distance of 985 miles, where the rate is 92½ cents. Also from Buffalo to Memphis, 815 miles, the first-class rate is 91 cents, and from Buffalo to Little Rock, distance of 952 miles, the rate is \$1.52 per hundred pounds, or 61 cents for 137 miles, as compared to 91 cents for a distance of 815 miles.

Coal.—The great smokeless coal fields which begin 50 miles north of Little Rock on the Arkansas River, we are told contain 800,000,000 tons of splendid coal, and this coal lies at least 800 miles nearer to tidewater than the Pennsylvania and West Virginia coal which is being shipped via the Ohio and Mississippi Rivers to New Orleans. This appears to me another most important factor in improving the Arkansas River.

Light-draft boats.—Recently we have had submitted to us by two large manufacturers of steamboats that a steel barge can be made especially for the Arkansas River, 160 feet in length, with a 34-foot beam, with water-tight bulkheads and equipped with paddle wheel, drawing 14 to 16 inches of water, light, and for each additional 14 tons placed on the boat she would draw 1 inch of water. This would enable her to carry 280 tons on 36 inches of water, and also enable her to tow two or three barges with 300 tons each on the same water, and if the 4-foot stage of water can be maintained in the Arkansas River from Little Rock to the mouth during a period of 10 months in the year, boat lines with modern equipment can be made to pay handsome profits on the same basis as the Kansas City Missouri River Navigation Co. are carrying freight to-day, namely at 80 per cent of the all-rail rate.

For immediate shipment by river.—The Aluminum Co. of America are moving now about 900 tons of bauxite to East St. Louis per day, this tonnage alone is sufficient to make a handsome profit for a transportation company, if the river were put in shape to navigate.

It is needless for me to refer in detail to the thousands of tons of freight submitted to you to-day in writing which can be moved on the Arkansas River, but I think it of sufficient importance to mention the total tonnage in and out of the city of Little Rock yearly. According to these figures a small proportion of this total amount of freight moved by river would be sufficient tonnage to sustain several boats in regular service.

To this end the Little Rock Chamber of Commerce has appropriated \$50,000 of its industrial fund for the subsidizing of boats and assisting in the navigation of the Arkansas River.

Final conclusions.—In the final consideration of the improvement of the Arkansas River we are confronted with the following important facts:

That the Arkansas River has one of the most fertile valleys in the world.

That the agricultural products moving from this valley will increase materially each year as the country is improved and opened up.

That the first mountains of stone which appear as you come from New Orleans, on the Mississippi and Arkansas Rivers, are found at Little Rock, Ark., the first rock on the river being named Little Rock by the original settlers of the valley.

That this stone is unlimited in quantity, lying on the banks of the river.

That several large magnificent quarries are open now at Little Rock on the banks of the river, and from the testimony already submitted hundreds of thousands of tons are available now for immediate shipment to the valley.

That the greatest oil fields in the South are found near Muskogee and Tulsa, Okla.

That the unlimited timber resources of the Arkansas Valley available for river shipment have scarcely been touched.

That 800,000,000 tons of smokeless and semismokeless coal lies along the Arkansas River Valley, this coal being of a superior quality and approximately 800 miles nearer to tidewater than the smokeless coals of West Virginia and Pennsylvania which move by the Ohio River and the Mississippi to New Orleans.

That the rice industry, practically a new industry in Arkansas, now produces over 3,000,000 bushels per year, worth more than \$3,000,000. This rice-producing territory lies within a short distance of the river, and the rice can be moved by a short railroad haul and the river to the markets of the world.

That the cities of Pine Bluff, Little Rock, Dardanelle, Ozark, Russellville, Clarksville, Fort Smith, Muskogee, and Tulsa are all thrifty, industrial, and commercial cities and must be supplied with raw materials and finished products manufactured throughout the world.

That the amount of tonnage handled in and out of Little Rock last year amounted to more than 120,000 cars, and independent of all of this tonnage, which is available for river shipment, we are now offered for immediate shipment by the Aluminum Co. of America as much tonnage approximately as was hauled on the Mississippi River during the year 1913 between the mouth of the Ohio and the mouth of the Missouri, as shown on page 102 in the Kansas City statement and brief of the case submitted to this board of engineers October 19, 1915.

I, therefore, state in conclusion and earnestly insist upon your body giving the following and final item your most careful consideration.

Taking into consideration the recent development in the aluminum industry throughout the entire world with the base of supply of this product in the western hemisphere at or near Little Rock, Ark., and with only 176 miles of Arkansas River to improve to complete the waterway, which is to receive at least 250,000 tons per year indefinitely, with the private corporation such as the Aluminum Co. of America having its millions of dollars invested in plants throughout the United States, with its one great reduction plant costing more than \$5,000,000 located on this waterway at East St. Louis, Ill., with \$1,500,000 invested in terminals at East St. Louis, equipped to receive bauxite by water, with the present rail rate of \$2.20 per ton on bauxite from Little Rock, Ark., to East St. Louis, Ill., with every reason to believe that the increase in this rate will bring the rate to \$2.40 or more per ton, with the approximate saving to this corporation of \$125,000 per annum by moving this bauxite ore by the water route, with the testimony of two representatives of this company given before your honorable body in this case, which testimony shows that this company will move its rough material by water if the river is made navigable, therefore the facts before you should be sufficient guarantee to the Federal Government that the Arkansas River and Mississippi River, over a distance of 800 miles, will be utilized and navigated if the rivers are put in condition to navigate.

Then, again, the empty barges from this movement of bauxite to come from St. Louis, down the Mississippi and up the Arkansas to Little Rock, will enable the manufacturers and shippers in the valley to take advantage of an exceptionally low commodity rate on all commodities moving from the north, east, and west to the southland.

Comparisons.—The three largest cities in Arkansas are Little Rock, Pine Bluff, and Fort Smith, all on the Arkansas River. All were founded and located largely because of the Arkansas River, all grew to be thrifty towns before any railroad came to Arkansas, and in all probability these cities will continue to be the largest cities in Arkansas because of the river facilities, and with the improvement of the river we are asking the Government to make it is only reasonable to assume that the growth of these cities will be greater in the future than it has in the past.

Railroads throughout America have nearly all received subsidies, bonuses, land grants, and other inducements to build into new territory. River projects can only succeed by Federal assistance and improvement. A river channel well improved for navigation should carry as much tonnage as 20 railroads. Most railroads are bonded for over \$50,000 per mile, and this amount is the figure placed on the Missouri River improvement project. The Missouri River project is no doubt a worthy one. The citizens at Kansas City have done more for inland navigation than any other community in the United States, and they should be commended for this good work, as the balance of the valley will receive a part of the benefits.

An expenditure of \$20,000,000 is of such magnitude to assure the shippers along the Missouri River of a permanent channel, and we therefore, in behalf of the good people on the Missouri River, also the entire citizenship on inland rivers, trust that the project may be completed as originally planned by Congress.

However, along this line let us call your attention to a few comparisons between the Missouri and the Arkansas Rivers. The Arkansas has the following items of tonnage of which the Missouri River citizens can not boast.

Eight hundred million tons of a superior quality of coal.

Vast forests of virgin timber along the river for a distance of over 500 miles.

Millions of tons of bauxite, of which 1,000 tons per day is shipped to East St. Louis.

In addition to the above, the tonnage available in cotton, cotton seed, and cotton products is enormous.

I beg now to call your attention to the following:

Extracts from the reports of the Board of Army Engineers from 1888 to year 1910.—In Document No. 234, Fiftieth Congress, page 16, we find an estimate of \$9,960,000 for the cost of the improvement to give a 3-foot channel at the lowest stage of water from Little Rock to the Canadian River and an estimate of \$6,400,000 to give a 4-foot channel from Little Rock to the White River Cut-off, aggregating \$16,360,000 for 409 miles of river. The report further states that the State of Arkansas is rapidly developing, as is also the Indian Territory, and both have great possibilities before them. In this connection we desire to call attention to the lapse of almost 30 years since this report was made and to the wonderful development of these two States since that time, and to the thousands of tons of freight now offered at Little Rock, Ark., by the aluminum people, which has never been offered before to the Board of Engineers of the Army and has never before been made a matter of record in any report on the Arkansas River.

In Document No. 150, the Fifty-sixth Congress, page 16, we find the following:

“From the deduced tables of duration of stages given heretofore it will be found that a volume of discharge of about 2,700 feet per second at Little Rock might be assumed as the smallest discharge for ordinary low water, as there were only 320 days in 21 years when the flow was not greater.”

We believe from this report that 20 years is sufficient time from which to figure the average flow at Little Rock in the low-water stage, and with this quantity of water we should be able to maintain a 4-foot channel from Little Rock to the mouth of the river practically all the year round if the proper confinement of the channel were established.

In Document No. 150, on page 22, the engineer makes the following statement:

“With regard to the relation and value of the improvement of the river to commerce, it may be said that any piecemeal work, such as has heretofore been provided for, can have hardly any perceptible effect upon commerce; but improvement upon a plan sufficiently comprehensive to assure a safe and reliable means of transportation, adapted to the needs of the commerce demanding such transportation, might in time develop a commerce of large magnitude.”

The country in the valley of the river contains much coal, which has as yet been hardly touched, and that alone, if we may judge by the experience in the Monongahela and Kanawha Valleys, would upon the opening of a river route develop a very large industry and commerce. Besides the coal, the principal product of the valley is cotton.

In connection with the above statements we desire again to impress upon your honorable body the new tonnage which is ready for movement by river at Little Rock, namely, 1,000 tons of bauxite ore to move daily to East St. Louis.

I note that in nearly every report of the engineers in the past 40 years that there is always a condition in the statements made relative to commerce justifying the expenditure for improvement, and that also references are made to the newness of the country and the lack of development. We can not refrain from again stating the wonderful development of the Arkansas Valley in the past 30 years.

In the last paragraph on page 22, Document 150, the statement is made as follows:

“An adequate improvement of the river would, as has been shown, cost a large amount of money. Whether the time is opportune and the needs of the

country sufficiently urgent for the inauguration of such a work are matters for congressional determination. From an engineering standpoint of view the board believes that the improvement of the river is feasible for open-river navigation from its mouth to the mouth of Grand River, the channels decreasing in size from Little Rock upward, but of sufficient dimensions to admit of boats of considerable size, at least as far as Fort Smith, and that if channels of greater depth should be desirable above Little Rock, a depth of 6 feet could be obtained by the construction of locks and dams."

From this statement we assume that there can be no question as to the feasibility of the project.

In Document No. 510, Sixty-first Congress, page 7, the engineer refers to the freight rate on coal out of the southern Illinois fields to several places, such as St. Louis, Chicago, Memphis, Little Rock, Monroe (La.), and Alexandria (La.), and shows the rate per ton-mile to be 4.7 mills, while out of the Arkansas field to Little Rock it is 12 mills a ton-mile, being nearly two-and-one-half times greater to Little Rock from Arkansas fields than from the Illinois fields to the points named.

He further shows that the saving to Little Rock in one year by freight reduction on coal would amount to \$86,850.

Attention is also called to page 8, Document No. 510, showing the effect the river would have on the freight rates of cotton and cotton products.

On pages 14 and 15, Document No. 510, the engineer makes the following statement under the following head:

"Improvement by permanent works, assisted by dredging: In this plan of improvement the permanent works will be revetments on caving banks, high dikes or dams to close back channels behind islands and middle bars, and low dikes built to about 8-foot stage at the foot of bends, the object sought being the control of the medium and high stages of the river sufficiently to cause it to flow in one continuous bed not divided by islands and middle bars, and to give a fixed direction and location to the channel over the crossings or shoals over which the desired depth of channel does not obtain by the means outlined above. No contraction of the low-water width by permanent works to produce a scouring of the bottom to increase the low-water depth is contemplated, because the generally sandy nature of the bed of the stream makes extreme contraction of water width undesirable. Since the plan contemplates only holding the banks and giving a fixed direction and location to the river when at medium and higher stages, the permanent works required will not be as extensive as when a complete contraction of low water is sought. Also since the permanent works will give the desired channel depth on many of the crossings, the number of dredges needed will not be as large as when dredging alone is contemplated; therefore, for purpose of estimating the cost of improvement by the combined method of permanent works and dredging, two dredges are taken as the number that will be required."

On page 16, same document, the engineer reports as follows:

"In my report upon the preliminary examination of this river I estimated that 622,000 tons of freight were directly affected by this improvement and that the probable annual savings to the community by reason of an equitable adjustment of freight rates would be about \$667,010. No further information has been obtained on this subject, except that the boats referred to in the preliminary examination are now actually in operation. The commercial worth of the country is increasing each year, and in the report referred to I stated that the time is coming when the commercial needs of the Arkansas Valley will warrant a permanent and final improvement of the Arkansas River above Little Rock by the construction of locks and dams, but that at the present time the river is worthy of improvement only to the extent of making a 3½-foot channel depth through ordinary low-water seasons. In view of the continual growth of the country and the length of time in which it takes to complete an improvement of this nature I am of the opinion that the undertaking of the improvement by the combined method mentioned in the preceding paragraphs is warranted now.

"Very respectfully, your obedient servant,

"M. L. WALKER,

"Major, Corps of Engineers.

"CHIEF OF ENGINEERS, UNITED STATES ARMY,

"Washington, D. C."

On page 18, Document No. 510, the engineer makes the following references:

"The board believes, however, that the efforts being made by local interests are deserving of some recognition if any relief or benefits can be afforded at a cost commensurate with these benefits. In a former report on the Arkansas River the board gave as its opinion that any expenditures Congress decided to make for the improvement of this river should be for dredging, and that the work should be undertaken tentatively by the use of two dredges on the reach below Little Rock. The present plan of transporting coal from the vicinity of Ozark, 144 miles above Little Rock, has matured since the date of the report referred to, and a great deal of interest is now manifested in the improvement of the upper reach. It is reasonable also to conclude from a study of present conditions that the ultimate development of commerce on this river will largely be determined by the success of the effort to create a coal trade on this section."

In view of this condition and the fact that the principal objects of the tentative dredging proposition was to demonstrate the effectiveness of improving the channel by this method, it is recommended that the field of operations be extended to Ozark and that the two dredges suggested be used where they will best serve the purpose for which intended. It is believed that this plan will determine the practicability of improving navigation at reasonable cost and will, during the period of trial, aid and encourage navigation."

On page 24, document No. 510, a letter from F. B. T. Hollenberg, of Little Rock, Ark., we note the following statements:

"The amount of money that the Government would have to spend would be many times returned in the simple reduction of these unjust rates and the large tonnage available for the moving of the products and the shipment of manufactured goods to them among a population roughly estimated at one-fourth of the State which is not served by the railroads, or if so, at a considerable hardship in the way of distances and the very highest railroad-traffic rates. It is not my purpose to go into detail or into a lengthy discussion of the matter, still requires some little space to even partially cover this subject; and as briefly as possible I will direct your attention to a few pertinent points."

"It is estimated by Mr. Fox, who has thoroughly studied the question of navigation of the rivers of the United States, that on a proper basis of freight rates the shippers in the vicinity of Little Rock would alone receive the benefits of upward of \$1,500,000 a year."

"Were it possible to convert the Arkansas River into a private corporation controlling the waterway, I would not hesitate to say the corporation would be formed within one week's time and would put such engineers and workmen on the river in such a way as to make it navigable at all times. But under the system of our Government that would be impossible, and hence we are absolutely dependent upon the Government to see that such a great waterway as the Arkansas is made navigable."

On page 25, document No. 510, we call especial attention to the complete letter of A. R. Bragg, manager of the Merchants' Freight Bureau:

"DEAR SIR: In the limited time I have had I have prepared and inclose herewith statement showing comparative rates on classes and commodities from New Orleans, Memphis, Louisville, Evansville, Paducah, Owensboro, etc., to Little Rock by rail, also by boat. The rates named by boat are taken from the tariff of the Arkansas River Packet Co. and the Memphis and New Orleans packets and are through rates, but are not used on account of there being no boats in the river above Pine Bluff."

"The comparison on coal shows the rates from mines in Illinois, Alabama, Tennessee, and Georgia to Memphis and to other points, also shows what the railroads are now charging between points in Arkansas on Arkansas-mined coal, and shows what they can haul coal for from mines in Illinois and other territory east of the Mississippi when necessary to do so to meet river competition."

"I am unable to give you the railroad rates on coal from Wheeling, Pittsburgh, and other Ohio and Kanawha River coal territory to Memphis, but am informed that it is about \$1.50 per ton. Am also advised that coal can be barged from that territory to Memphis and New Orleans for about 20 cents per ton. This is absolutely a fact; otherwise the railroads would not make the rates they are now making to meet water competition."

"I have had a practical knowledge of railroad and river rates for 25 years, and believe if the Arkansas river is made navigable and used, as the Mississippi, Ohio, Kanawha, and other rivers, the rates of freight to and from Little Rock, Pine Bluff, Fort Smith, and all other river points will be reduced at least 50 per cent. Such reduction would extend to and from all territory in which the merchants and manufacturers of these cities do business.

"Yours, truly,

"A. R. BRAGG."

Document No. 150, Fifty-sixth Congress, December 7, 1900, on page 21, we find the following relative to the cost of improvement on the Arkansas River from the mouth of the Grand River to the Mississippi:

"On this part of the river, where there is but one point showing any indication of rock, the banks and bed are of extremely soft material, easily eroded. The construction and maintenance of locks and dams would be hazardous and very costly. The board is of the opinion, therefore, that any improvement made should be for open-river navigation. Such improvement could be made, giving channels not less than 300 feet in width, with mean depth of about 5 feet and control depth of about 7 feet in ordinary low water. For a large part of the year such channels would be wider and deeper. Plans are presented for the improvement of this section of the river, with estimates for reaches, viz: Mouth to Pine Bluff, 107 miles; Pine Bluff to Little Rock, 66 miles.

"The estimates of cost are as follows:

Mouth to Pine Bluff, 107 miles:

501,850 feet of revetment, at \$10-----	\$5, 018, 500
61,800 feet of low dikes, at \$10-----	618, 000
23,500 feet of high dikes, at \$20-----	470, 000
13,000 feet of abattis, at \$2.50-----	32, 500

Total-----	6, 139, 000
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Pine Bluff to Little Rock, 66 miles:

219,450 feet of revetment, at \$10-----	2, 194, 500
43,350 feet of low dikes, at \$10-----	433, 500
50,550 feet of high dikes, at \$20-----	1, 011, 000
29,450 feet of abattis, at \$2.50-----	73, 625

Total-----	3, 712, 625
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Grand total of cost for open-river improvements:

Mouth to Pine Bluff-----	6, 139, 000
Pine Bluff to Little Rock-----	3, 712, 625
Little Rock to Dardanelle-----	4, 509, 500
Dardanelle to Fort Smith-----	5, 602, 725
Fort Smith to Grand River-----	5, 159, 875

Total-----	25, 123, 725
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"In addition to the complete formation and maintenance of channels there is another work that would be absolutely necessary for providing safety of navigation—that is the constant removal, at least for many years, of the snags formed by the enormous quantity of drift that passes down the river. For this purpose a properly equipped light-draft steel-hull snag boat should be provided at a cost of about \$75,000 and provision made for its operation and maintenance, which would require about \$25,000 per year."

From this recent report we assume that the Arkansas River can be made permanently navigable from Little Rock to the mouth of the river at a cost of less than \$10,000,000 and that the upper river can be improved and made navigable from Little Rock to the mouth of the Grand River at approximately \$15,000,000.

If the project is a feasible one in its entirety, is it not possible for your honorable body to immediately adopt a permanent policy and plan and improve the river in sections according to the actual tonnage offered for immediate movement, and there can be no question but that an expenditure of \$10,000,000 is wholly justifiable in view of the fact that such a vast amount of tonnage is offered for immediate shipment over the lower section of the river up as

far as Little Rock. This section of the river has been many times referred to as the section to be improved by open-river navigation, and the balance of the river has received favorable reports from the engineers for improvement by locks and dams. If this is the conclusion of your honorable body, we trust that the recent hearing at Little Rock and the evidence in this brief has disclosed sufficiently new development in the valley and sufficient additional tonnage for river shipment to warrant a most careful resurvey of the Arkansas River project and the recommendation of your body for permanent improvement of the river.

Very respectfully,

CARL J. BAER,
Secretary Chamber of Commerce,
Little Rock, Ark.

EXHIBIT N-1.

Comparative statement of all-rail freight rates on classes and commodities from points shown to Memphis, Tenn., and to Little Rock and Pine Bluff, Ark., by Carl J. Baer, secretary Little Rock Chamber of Commerce.

[In cents per 100 pounds.]

Class or commodity.	To—	From—					
		St. Louis, Mo.	Louisville, Ky.	Cincinnati, Ohio.	Nashville, Tenn.	Pittsburgh, Pa.	Chicago, Ill.
First class.....	Memphis.....	65	65	75	50	90	85
	Little Rock.....	100	112.8	121.9	106	152.7	120
Second class.....	Memphis.....	50	50	60	38	70	65
	Little Rock.....	85	95.6	102.6	93	132.4	101
Third class.....	Memphis.....	45	45	55	35	59	55
	Little Rock.....	65	72.2	78.2	69	98.8	77
Fourth class.....	Memphis.....	35	35	40	27	46	43
	Little Rock.....	49	54.8	59.8	52	73.2	59
Axes, any quantity.....	Memphis.....	35	35	40	27	46	42
	Little Rock.....	85	95.6	102.6	93	130	101
Bags, burlap, etc.....	Memphis.....	15	15	19	12	23	17
	Little Rock.....	30	37.2	43.2	34	63.8	42
Candles, any quantity..	Memphis.....	25	25	30	19	32	31
	Little rock.....	49	54.8	59.9	62	73.2	59
Canned goods.....	Memphis.....	20	20	24	15	27	25
	Little Rock.....	25	28.7	32.7	27	45	32
Canned goods (L. C. L.)..	Memphis.....	35	35	40	27	46	43
	Little Rock.....	49	54.8	59.8	52	73.2	59
Iron and steel, special (C. L.).....	Memphis.....	13	13	16	8	25	19
	Little Rock.....	23	26.7	32.7	25	33	30
Iron and steel articles (L. C. L.).....	Memphis.....	20	20	24	13	29½	26
	Little Rock.....	49	54.8	59.8	52	73.2	50
Lead, pig, bar, sheet, pipe (C. L.).....	Memphis.....	17	17	21	12	24	22
	Little Rock.....	35	38.7	42.7	37	55.1	42
Paints (C. L.).....	Memphis.....	16	16	20	11	24	22
	Little Rock.....	28	31.7	35.7	30	48	35
Paints (L. C. L.).....	Memphis.....	25	25	30	19	31	.....
	Little Rock.....	49	54.8	59.8	52	73.2	59
Paper, wrapping, bundles (C. L.).....	Memphis.....	18	18	22	13	25	23
	Little Rock.....	34	37.7	41.7	36	54	41
Paper bags (C. L.).....	Memphis.....	15	15	20	11	23	21
	Little Rock.....	34	37.7	41.7	35	54.1	41
Peanuts (C. L.).....	Memphis.....	20	20	24	15	.....	25
	Little Rock.....	48	55.2	61.2	52	81.8	60
Peanuts (L. C. L.).....	Memphis.....	35	35	40	27	43	.....
	Little Rock.....	65	72.2	78.2	69	98.8	77
Plumber's material (C. L.).....	Memphis.....	30	30	35	23	39	37
	Little Rock.....	39	40.7	44.7	39	59.1	44
Roofing and building material, any quantity.....	Memphis.....	15	15	19	10	23	21
	Little Rock.....	27	30.7	34.7	29	47.1	34
Rope, twine, lath.....	Memphis.....	25	25	30	19	33	31
	Little Rock.....	49	54.8	59.8	52	73.2	59
Soap, soap powder (C. L.)	Memphis.....	13	13	17	8	21	19
	Little Rock.....	30	33.7	37.7	32	50.1	37
Starch (C. L.).....	Memphis.....	20	20	24	15	.....	17
	Little Rock.....	27	30.7	34	29	47	34
Tin plate (C. L.).....	Memphis.....	16	16	20	11	25	22
	Little Rock.....	37	40.7	44.7	39	45.1	44
Vehicles, farm wagons (C. L.).....	Memphis.....	21	21	25	16	28	26
	Little Rock.....	33	37.7	42.7	36	54.1	42

Pine Bluff takes Little Rock rates.

EXHIBIT N-2.

NOVEMBER 16, 1915.

DEAR MR. BAER: Agreeable to my promise I hand you herewith a list of the class rates from New York, Boston, and other seaboard territory points to East St. Louis, which will give the rates from those points to East St. Louis under milage, versus rates that you have already in your possession from St. Louis to Little Rock.

From—	First.	Second.	Third.	Fourth.	Fifth.	Sixth.
	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.
New York.....	92.2	79.9	61.4	43.1	56.9	30.8
Boston.....	92.2	79.9	61.4	43.1	54.9	30.8
Philadelphia.....	86.2	79.9	59.4	41.1	34.9	28.8
Baltimore.....	84.2	71.9	58.4	40.1	33.9	27.8
Albany.....	76.4	66.2	50.9	35.7	30.6	25.5
Rochester-Syracuse.....	64.5	55.9	43.0	30.2	25.8	21.6
Cumberland-Williamsport.....	71.0	61.5	47.3	33.2	28.4	23.7
Buffalo-Pittsburgh.....	59.3	51.5	39.4	27.2	25.6	19.4
Youngstown.....	57.3	49.5	37.4	25.3	21.6	17.4
Cleveland.....	55.3	47.5	35.4	24.3	20.6	16.4

You will note rate from New York to St. Louis is 92½ cents per hundred for about 985 miles, as against rate of \$1 per hundred St. Louis to Little Rock, a distance of 365 miles. Practically all westbound rates to Mississippi River crossings versus rates from Mississippi River crossings are about the same ratio.

Yours, truly,

A. R. BRAGG, *Traffic Manager.*

Mr. CARL J. BAER,

Secretary Chamber of Commerce, Little Rock, Ark.

EXHIBIT N-3.

Effect of water competition on rail rates at Memphis, Tenn., versus Pine Bluff and Little Rock.

	From—						
	Buffalo, N. Y.	Detroit, Mich.	Cleve- land, Ohio.	Dayton, Ohio.	Cincin- nati, Ohio.	Kansas City, Mo.	St. Louis, Mo.
Distance to:							
Memphis, Tenn.....	815	752	756	548	494	484	305
Pine Bluff and Little Rock.....	952	889	893	685	631	514	358
First class rate to:							
Memphis, Tenn.....	\$0.91	\$0.91	\$0.91	\$0.75	\$0.75	\$0.80	\$0.65
Pine Bluff and Little Rock.....	1.527	1.425	1.425	1.342	1.219	1.10	1.00
Rate per ton per mile to:							
Memphis, Tenn.....	.0223	.0242	.0241	.0274	.0304	.0331	.0426
Pine Bluff and Little Rock.....	.0321	.0321	.0319	.0392	.0386	.0428	.0528
Rate per ton per mile to Mem- phis applied to mileage to Pine Bluff and Little Rock...	1.062	1.076	1.075	.937	.958	.849	.763
Reducing present rate to Pine Bluff and Little Rock.....	.465	.35	.35	.405	.26	.251	.237
Saving per ton	\$9.30	\$7.00	\$7.00	\$8.10	\$5.20	\$5.02	\$4.74

EXHIBIT N-4.

Statement showing the present rail rates and the boat rates from river points to Pine Bluff, Ark.

From—	First class.		Second class.		Third class.		Fourth class.	
	Rail.	River.	Rail.	River.	Rail.	River.	Rail.	River.
Cincinnati, Ohio.....	\$1.219	\$0.75	\$1.026	\$0.65	\$0.782	\$0.50	\$0.598	\$0.40
Louisville, Ky.....	1.128	.75	.956	.65	.722	.50	.548	.40
St. Louis, Mo.....	1.00	.75	.85	.65	.65	.50	.49	.40
Memphis, Tenn.....	.78	.45	.60	.35	.45	.30	.36	.25

Freight moving from Cincinnati, Louisville, and St. Louis to Pine Bluff is handled by three boat lines and from Memphis by two lines.

The above rates have been effective for only one year, and it will be noted that they are from 20 to 75 per cent lower than the rail rates.

The estimated saving to the Pine Bluff shippers during the past year on traffic from these points alone is \$4,000, and the movement is doubling every few months.

TONNAGE AVAILABLE IMMEDIATELY FOR RIVER TRANSPORTATION AT LITTLE ROCK AND AT POINTS BETWEEN LITTLE ROCK AND PINE BLUFF.

After a thorough investigation by J. R. Alexander, one of the largest planters between Pine Bluff and Little Rock, the following tonnage is shown:

	Tons.
24,084 bales of cotton-----	6, 021
Cotton seed -----	12, 042
Supplies, etc., shipped in (estimated)-----	1, 800
Total-----	19, 863

This tonnage is taken from the gin records and does not include seed left on plantation for planting. All of this tonnage should move by river, as these plantations lie along the river bank.

In 1914 there was received at Little Rock 172,291 bales of cotton, and in 1914 there was shipped out of Little Rock 177,029 bales of cotton.

EXHIBIT N-5.

In 1914, 53,107 cars of other commodities were received at Little Rock and 63,193 cars of other commodities shipped out. Total amount, 116,300 carloads.

The commodities in less-than-carload lots have not been included in these figures. One hundred and sixteen thousand three hundred carloads, at 30 tons each, amounts to 3,489,000 tons.

If 5 per cent only of the total tonnage were given to a boat line we would move 174,540 tons per annum by water.

EXHIBIT N-6.

	Receipts, 1914.	Ship- ments, 1914.
	Cars.	Cars.
Bran.....	571	82
Building material.....	3, 976	10, 997
Coal.....	2, 326	246
Cooperage.....	2, 464	1, 241
Cotton seed.....	3, 563	78
Cottonseed hulls.....	49	218
Cottonseed meal.....	118	1, 377
Cottonseed oil.....	12	305
Feed.....	912	4, 663
Flour.....	518	114
Furniture.....	279	275
Hay.....	1, 375	385
Hardware.....	301	66
Ice.....	7	282
Live stock.....	259	61
Liquor.....	781	13
Logs.....	829	51
Lumber.....	2, 649	1, 315
Machinery.....	275	107
Meal.....	186	41
Meat.....	635	66
Oil.....	580	129
Produce.....	1, 315	398
Wood.....	352	122
Merchandise.....	14, 739	31, 983
Miscellaneous.....	9, 859	6, 556
Corn.....	1, 825	354
Oats.....	2, 292	1, 257
Wheat.....	66	11
Total.....	53, 113	62, 793
Cotton	Bales. 172, 991	Bales. 177, 029

The Arkansas Brick & Manufacturing Co. offer yearly 60,000 tons for river shipment.

EXHIBIT N-7.

GENTLEMEN: Replying to your request as to the amount of brick that could be shipped via the Arkansas River, in case it is improved so that it can be navigated the year around, will say that our plant has a capacity of about 60,000,000 brick per year. We make common brick, press brick, and paving brick.

A very large amount of this tonnage could be shipped by barge to points along the Mississippi River and down to New Orleans. We estimate that we could give you at least 60,000 tons. The railroad rates to Mississippi River points are prohibitive.

The improvement of the Arkansas River is greatly needed; in fact, it is the only thing that will build up our manufacturing interests.

Yours, truly,

ARKANSAS BRICK & MANUFACTURING Co.,
By W. W. DICKINSON, *President*.

The ARKANSAS RIVER IMPROVEMENT ASSOCIATION,
Little Rock, Ark.

The Big Rock Stone & Construction Co. ship from 100,000 to 300,000 tons riprap per year to Mississippi River points, which could move by river. They also produce 350,000 tons of crushed stone annually.

EXHIBIT N-8.

GENTLEMEN: Replying to yours, requesting us to give you an estimate of the amount of stone and other materials produced by us that could be shipped by river from this point, in case the river was navigable the year round, will say that there is a large amount of riprap used in revetting the banks of the Mississippi River that could be furnished from this point at a less price than it could be secured from any other point, if the river was improved so as to permit the barging of it out. There is shipped annually from this point and from nearby points 100,000 to 300,000 tons of riprap, which goes by rail to Mississippi River points. All of this stone could be barged by river to points where it is being used along the Mississippi River, provided the river was navigable the year round. Enough stone from this point and from points above here on the Arkansas River can be secured to supply the requirements of the Mississippi River. It could be shipped cheaper by barge than by rail.

Besides this, we produce about 350,000 tons of crushed stone yearly. A large part of this could be barged to points along the Arkansas and Mississippi Rivers at less freight cost than is now being charged by rail.

Our crushing plant is situated on the bank of the Arkansas River at the foot of Fort Logan H. Roots. In years past the Government loaded riprap from this point and barged it to Mississippi River points.

We are very much in favor of improving the river, and we hope that when the engineers meet on the 16th instant that they will decide to recommend a sufficient appropriation to be made to make the river navigable the year round. The improvement of the river is imperative if this community is to grow as it should. Our rates are very much higher than the Mississippi River rates, and unless we are placed upon an equality basis we can not expect industries to thrive in this community.

Yours, truly,

BIG ROCK STONE & CONSTRUCTION Co.,
By W. W. DICKINSON, *President*.

The ARKANSAS RIVER IMPROVEMENT ASSOCIATION,
Little Rock, Ark.

The United States Government used on the Mississippi River last year below the mouth of the Arkansas River 122,000 tons stone, and above mouth of Arkansas River 36,000 tons, to Cairo from Little Rock by river.

EXHIBIT N-9.

[Telegram.]

LITTLE ROCK CHAMBER OF COMMERCE,
Little Rock, Ark.

Stone purchased under contract this year for use below mouth of Arkansas River, 122,000 tons; above mouth of Arkansas River, 36,000 tons. Letter follows.

KINGMAN,
Chief of Engineers.

This we can supply cheaper than any other territory. Our stone quarries are on the banks of the Arkansas River and are inexhaustable. The average amount used by the United States Government on the Mississippi River below Cairo during three years, 1913, 1914, and 1915, is shown in Exhibit N-10.

EXHIBIT N-10.

GENTLEMEN: 1. Complying with request contained in your letter of the 6th instant, addressed to the Department of Commerce, received in this office on the 11th instant, and your telegram of the 12th instant to the War Department, the following is furnished to supplement the brief data contained in telegram of this date. The tabulation shows the contracts entered into during the calendar years 1913, 1914, and 1915. They do not all provide for full delivery during the calendar year in which they were entered into. Contracts furthermore permit an increase or decrease of from 10 to 20 per cent from the quantities specified, and the examination did not extend to the ascertainment of the quantities actually furnished. If any stone was obtained otherwise than by contract, the information here furnished is to that extent also incomplete.

Below mouth of Arkansas River:

1913-----	{ 58,000 cubic yards.
	{ 64,000 tons.
1914-----	95,000 tons.
1915-----	122,000 tons.

Above mouth of Arkansas and below mouth of Ohio Rivers:

1913-----	{ 45,000 tons.
	{ 25,000 cubic yards.
1914-----	{ 40,000 tons.
	{ 30,000 cubic yards.
1915-----	{ 20,000 tons.
	{ 16,000 cubic yards.

2. If the above should not be in sufficient detail to serve your purpose, it is suggested that you communicate with the district engineer officers checked on the accompanying list.

By direction of the Chief of Engineers.

Very respectfully,

J. A. WOODRUFF,
*Major, Corps of Engineers.*LITTLE ROCK CHAMBER OF COMMERCE,
Mr. Carl J. Baer, Secretary, Little Rock, Ark.

The estimate made by Leo Yount, manager of the log department of the Little Rock Lumber & Manufacturing Co., shows 500,000,000 feet of timber available for transportation on river. This company moved by river last year from 90 miles up above Little Rock to Little Rock, 500,000 feet, or 3,000 tons, and were only operating a few months.

It is a very safe estimate to say 2,000,000 tons of timber should move in the next 10 years to Little Rock, or an average of 200,000 tons per year.

EXHIBIT N-11.

DEAR SIR: In response to your request for an estimate of the timber tributary to the Arkansas River, I beg leave to submit the following opinion:

In my capacity of manager of the log department of the Little Rock Lumber & Manufacturing Co., I have been called upon to investigate this matter for

my principals. In my opinion there is approximately 350,000,000 feet of timber which is available for transportation on the Arkansas River to Little Rock. In all probabilities there would be 500,000,000, provided river conditions were favorable; but in estimating the amount at 350,000,000, I have made this conservative for the reason that in order to get the 500,000,000 it would be necessary to make the handling of these logs very economical. The 350,000,000 is available with the river in condition to operate from 8 to 10 months a year.

Under present conditions my investigation has satisfied me that 40,000,000 to 50,000,000 feet would be as much as could be handled, and this would leave the most valuable timber in the forest, as only a small portion of hardwood timber will float.

Hardwood logs will weigh on the average close to 12 pounds per foot. This report will show you that with 350,000,000 feet available, it will be possible to handle over 2,000,000 tons.

Yours, very truly,

LEO YOUNT.

Mr. CARL J. BAER,
Secretary Little Rock Chamber of Commerce,
Little Rock, Ark.

The Pulaski Cooperage Co. moved last year, 11,000 tons, and would move 22,000 if the river was made navigable.

EXHIBIT N-12.

DEAR SIR: The Pulaski Cooperage Co. handled via river last year 11,000 tons, but if a good boating stage could be maintained the year round we would ship in to our plant twice the above tonnage.

Yours, truly,

PULASKI COOPERAGE Co.

Mr. CARL J. BAER,
Secretary Arkansas River Improvement Association,
Little Rock, Ark.

The Beebe Stave Co. moved by water last year 7,500 tons.

EXHIBIT N-13.

DEAR SIR: On request of Mr. Longley, we are pleased to report that we handle annually not less than 3,000 cubic cords of stave bolts by barge and boat from points below Little Rock on the Arkansas River. A cord of stave bolts will weigh 5,000 pounds, consequently we handle 7,500 tons of river freight each year by barge and boat.

In addition to this, we raft and run on an average of 1,000,000 feet of logs annually from upriver points.

Trusting this information will serve your purpose, we are,

Very truly, yours,

BEEBE STAVE Co.

Mr. CARL J. BAER,
Secretary Arkansas River Improvement Association,
Little Rock, Ark.

The Alfrey Heading Co. would move approximately 8,000 tons by river each year.

EXHIBIT N-14.

DEAR SIR: In accordance with a request of your representative who called on me this morning, will say that from March 1, 1915, up to November 1, I have received in inbound tonnage at my plant a total of 43,817,600 pounds of rough material. Now, if conditions are right and I could absolutely depend on it, I could obtain fully 35 to 40 per cent of this tonnage from off the river.

Yours, truly,

W. F. ALFREY.

Mr. CARL BAER,
Chamber of Commerce, Little Rock, Ark.

The W. W. Wilson & Wrape Stave Co. could easily move 1,000 tons per year.

EXHIBIT N-15.

DEAR SIR: In speaking of the river transportation question, will say that with the Arkansas River made navigable the year round, and with proper facilities for handling, we believe that we could easily handle 1,000 tons of timber per year by river transportation, which is not accessible to us now.

We are very much in favor of river transportation on the Arkansas River, as we believe that it would be of much value to a large number of the people of our State, and especially to the people of Little Rock and other cities located on the Arkansas River. Other rivers of Arkansas have been improved and made navigable by Government aid, and it seems strange to us that the Arkansas River, the most important river in our State, should have been overlooked and neglected, as has been the case.

Yours, respectfully,

W. W. WILSON, *President.*

Mr. CARL J. BAER,
*Secretary Chamber of Commerce,
Little Rock, Ark.*

The Kansas City Hardwood Flooring Co. could easily move 1,000 tons per year.

EXHIBIT N-16.

DEAR SIR: Wish to advise that we estimate that, under favorable conditions; that is, equal freight rates, etc., we could furnish the river transportation company with at least 2,000,000 pounds of tonnage per year. This, of course, could be increased if conditions were made favorable enough.

Yours, very truly,

KANSAS CITY HARDWOOD FLOORING Co.,
By R. G. BRUCE, *Vice President.*

Mr. CARL J. BAER,
*Secretary Arkansas River Improvement Association,
Little Rock, Ark.*

The following 36 letters from shippers at Little Rock have been received by the Little Rock Chamber of Commerce, relative to usage of the Arkansas River if it were made navigable.

These 36 shippers only represent about 10 per cent of the total number of shippers in the city of Little Rock, and they agree to ship approximately 50,000 tons per year.

DEAR SIR: We have your circular letter of the 9th asking in regard to tonnage which we might be able to give to river transportation. We will be glad to give 2,000,000 pounds a year, provided the rates and service justify it. This might be increased if conditions were favorable.

Yours, truly,

LITTLE ROCK LUMBER & MANUFACTURING Co.,
By D. S. WATROUS, *Secretary-Manager.*

Mr. CARL J. BAER,
Little Rock, Ark.

GENTLEMEN: Acknowledging receipt of your letter of the 9th, in regard to the Arkansas River navigation project, beg to say we are only merchandise brokers, selling in car lots direct to the jobbing trade, therefore we are not in a position to promise any tonnage direct to your association.

Yours, truly,

DEASON & COOPER.

ARKANSAS RIVER IMPROVEMENT ASSOCIATION,
Little Rock, Ark.

DEAR SIR: According to our promise to Mr. Longley of Saturday, we write to you with reference to the approximate amount of freight that could be handled from this company on the Arkansas River under favorable navigation, and after giving the matter considerable thought we believe that we are justified in saying that the tonnage that could be handled by boat running between Little Rock and Memphis with this company would amount to approximately 75 tons. It is, of course, contingent on the boat being able to make regular and scheduled trips.

Yours, truly,

INTERNATIONAL HARVESTER CO. OF AMERICA.

Mr. CARL J. BAER,
Secretary Chamber of Commerce, Little Rock, Ark.

DEAR SIR: This is to advise that under favorable conditions we will probably handle 100 tons freight on Arkansas River boats.

Yours, truly,

COOPER-DICKINSON GROCERY CO.

Mr. CARL J. BAER,

Chamber of Commerce, Little Rock, Ark.

NOVEMBER 5, 1915.

DEAR SIR: For your information will state that we handle out of St. Louis from 25 to 30 cars annually, and out of Nashville, Tenn., 50 or more cars annually.

We are heartily in accord with the movement to open the river traffic to Little Rock, and fully appreciate what that would mean to shippers and consumers in this connection.

BRANDON & TURNER CO.

Mr. CARL J. BAER,

Chamber of Commerce, Little Rock, Ark.

DEAR SIR: Referring to your letter of the 9th. We probably handle 3,000 tons per year, and, if the river rates offered any inducement, we would probably handle half of it that way.

Yours, truly,

CENTRAL SUPPLY CO.

Mr. CARL J. BAER,

*Secretary Arkansas River Improvement Association,
Little Rock, Ark.*

DEAR SIR: Answering your letter of the 9th instant concerning the tonnage that we are receiving in the way of freight, we wish to say that our income freight is, in round numbers, 1,000 tons, and if we will get river navigation on the Arkansas we can safely further say that if we can save 20 per cent on the freight charges that two-thirds of that tonnage can be hauled by water.

Yours, very truly,

THE GUS BLASS DRY GOODS CO.

Mr. CARL J. BAER,

Chamber of Commerce, Little Rock, Ark.

DEAR SIR: In conversation with your Mr. Longley to-day he requested that we advise the chamber of commerce approximately the tonnage we could move by river if we had the proper facilities. Both our inbound and outbound tonnage would be subject to considerable fluctuation. The inbound tonnage would be governed very largely by the size of the cotton crop, but we feel safe in estimating that we would average 1,000 tons of seed annually by river if we had the proper facilities. We use during a season on an average of 2,500 tons of coal, which, no doubt, could be handled to better advantage under favorable conditions by water.

Our outbound tonnage would probably fluctuate even more than our inbound tonnage, varying from a minimum of 1,000 to a maximum of 5,000 tons. At the present moment we have 600 tons to move to ship side for export through New Orleans for November shipment alone, and, with the export demand good, this tonnage would be probably increased to 2,000 to 2,500 tons. Under normal conditions abroad a larger portion of our lint production goes for export. Our normal production would be 2,500 bales, with an average of 50 per cent of that for river movement.

At the present moment, however, we neither receive nor ship a single pound of freight by river.

Yours, truly,

ROSE CITY COTTON OIL MILL.

Mr. CARL J. BAER,

Chamber of Commerce, Little Rock, Ark.

NOVEMBER 10, 1915.

DEAR SIR: In reference to tonnage we might receive by boat, will say a greater portion of our goods comes all rail from northern and southeastern points. However, we could probably use 25 tons or more a year by boat.

Yours, truly,

BOWSER FURNITURE CO.

Mr. CARL J. BAER, *Chamber of Commerce, Little Rock, Ark.*

DEAR SIR: Replying to yours of the 9th, and also fulfilling a promise made to Mr. Longley when he called upon us personally, we herewith submit a statement of our knowledge and experience as to river shipping.

For the last few years on account of the lack of river shipping facilities we have only had brought in by river freight 1,000 to 1,500 tons of cotton seed per year. Several years ago when facilities were better we received from 5,000 to 8,000 tons by river per year, and if the river channel was improved between Pine Bluff and Fort Smith until boats could run regularly in the early fall, we could easily turn 8,000 to 10,000 tons of freight through the river route. Under present difficult conditions, existing on account of the channel being so shallow, the boats can not run regular enough to make a living and charge reasonable freights. If the channel could be deepened and straightened so that we could depend upon boats making regular trips once or twice each week, there would be an immense tonnage available during all seasons of the year between Pine Bluff and Fort Smith, and I suppose above Fort Smith as far as Muskogee; but in speaking of from Pine Bluff and Fort Smith, I speak from personal knowledge.

I hope I may be able to attend the convention on the 16th, but whether I am there or not, if this letter can be of any service to you, you are welcome to use it.

Yours, very truly,

LITTLE ROCK COTTON OIL CO.

Mr. CARL J. BAER,

*Secretary Arkansas River Improvement Association,
Little Rock, Ark.*

DEAR SIR: Mr. Longley has called in at our office twice in reference to your letter of the 9th.

It would be rather difficult for us to give you some intelligent idea as to the amount of tonnage we could handle by boat lines, either to or out of Little Rock.

We use in our manufacturing business all native lumber. We do, however, buy considerable window glass, also paints such as white lead and linseed oil. The latter two items come mostly from St. Louis, and we should say that we handle in that commodity somewhere between 400 and 500 tons per annum which, of course, we would be glad to handle by river if we could, out of St. Louis or near-by points.

As to the outbound, it would all depend upon how far up the river the boats would go, but I should say we would handle 50 to 100 tons.

Yours, very truly,

CHAS. T. ABELES & Co.

Mr. CARL J. BAER,

*Secretary Arkansas River Improvement Association,
Little Rock, Ark.*

DEAR SIR: In view of the fact that there will be held in this city to-morrow a meeting of the United States engineers, I wish to state that should we have river navigation it would be possible for me to handle by boat tonnage approximately 250 to 300 tons per annum.

Yours, truly,

J. W. MAST.

Mr. CARL J. BAER, *Chamber of Commerce, Little Rock, Ark.*

DEAR SIR: Answering yours of the 9th, will say that we receive during the course of a year on the average of from 20 to 40 cars of freight in addition to probably 10 cars in local shipments. We think that one-half of this could move by boat. The minimum weight per car on the class of goods we ship runs from 12 to 23 tons.

Yours, truly,

PETTIT-GALLOWAY CO.

Mr. CARL J. BAER,

Secretary Chamber of Commerce, Little Rock, Ark.

DEAR SIR: In connection with the Arkansas River transportation proposition, wish to advise that I am in correspondence now with parties who hope to soon complete arrangements to ship their coal by river from the Denning field in

Franklin and Johnson Counties. If this coal proposition works out, it will mean the transportation of some 20,000 tons of coal by river to Little Rock and vicinity.

Yours, truly,

R. H. McNAIR.

Mr. CARL J. BAER,
Secretary Arkansas River Improvement Association,
Little Rock, Ark.

DEAR SIR: Replying to yours of the 9th instant, will state that we have received during the year 1914 and to this date 200 cars of merchandise from points originating east of the Mississippi River. We would be glad to divert as much as possible to any river connection at Memphis, and are ready to co-operate with you in any project of this kind.

Yours, truly,

DOYLE-KIDD DRY GOODS Co.

Mr. CARL J. BAER,
Secretary Arkansas River Improvement Association,
Little Rock, Ark.

DEAR SIR: Replying to your favor of the 9th, beg to advise that if the water rate were 20 per cent lower than the rail rate, we could give you approximately 100 carloads, averaging from 12,000 to 16,000 pounds, out of State shipments; while we receive about 25 cars, averaging 12,000 pounds minimum per car, and about 20 to 25 cars, averaging from 30,000 to 40,000 pounds per car.

This is the exclusive of local in and out bound shipments.

Trusting this is the information wanted, and wishing you success, we are,

Yours, very truly,

THE JOP-PA MATTRESS Co.

Mr. CARL J. BAER,
Secretary Arkansas River Improvement Association,
Little Rock, Ark.

DEAR SIR: In line with questions asked by your representative, Mr. Longley, beg to advise that the probable amount of freight that we could ship by water under favorable conditions would be approximately 150 tons. We have not had the advantage of river shipments, and therefore our estimate will necessarily have to be conservative and purely an opinion.

Trusting that this movement will secure this much-needed water transportation, I am,

Yours, truly,

THE MURRAY MACHINERY Co.,
A. R. PANNELL, *Manager.*

Mr. CARL J. BAER,
Secretary Arkansas River Improvement Association,
Little Rock, Ark.

DEAR SIR: In compliance with your request I desire to state that our firm is heartily in sympathy with the movement of river transportation, and assure you that if they can offer us satisfactory facilities in the way of service, rates, and the expediting delivery of our freight we shall be very glad indeed to favor the transportation company with as much business as possible.

Wishing you much success in this most laudable undertaking, we are,

Yours, truly,

PFEIFER BROS.

Mr. CARL BAER,
Chamber of Commerce,
Little Rock, Ark.

DEAR SIR: In reference to river navigation: For your information we would say that the Norton-Berger Shoe Co. freight account will average about \$11,000 each year, of which under favorable conditions 75 per cent could be brought in here by boat, provided the service was dependable, which, of course, it would have to be in order to have them come that way.

Yours, truly,

NORTON-BERGER SHOE Co.

Mr. CARL J. BAER,
Chamber of Commerce,
Little Rock, Ark.

DEAR SIR: In answer to your letter with reference to tonnage for the Arkansas River navigation project will state we can handle approximately 250 tons per year.

Yours, very truly,

ARKANSAS CARPET & FURNITURE Co.

Mr. CARL BAER,
Secretary Chamber of Commerce,
Little Rock, Ark.

DEAR SIR: As per your conversation with our Mr. Tedford, we wish to advise that if we can get good river service we will ship about 400 tons freight per annum from Memphis.

Yours, truly,

WILLIAM L. TEDFORD.

Mr. CARL J. BAER,
Chamber of Commerce,
Little Rock, Ark.

DEAR SIR: I notice there will be a meeting on the 16th to consider the river traffic with Government officials.

I beg to advise that I figure there are 3,000 tons of cotton seed from our customers each year that is hauled from 10 to 15 miles to railroad points which could be handled by river with only a few miles haul. We figure it would be a great advantage to every farmer on the Arkansas River if this stream was navigable the entire year.

I sincerely trust the Government will give their assistance.

Yours, very truly,

THE SOUTHERN COTTON OIL Co.

Mr. CARL J. BAER,
Secretary Chamber of Commerce,
Little Rock, Ark.

DEAR SIR: One of your representatives was in our office a few days ago asking in reference to the probable tonnage we could give in support of the regular line of boats on the Arkansas River, and we write to advise we have no way of definitely determining, but think we would be safe in estimating same to be at least 350,000 to 400,000 pounds a year.

Trusting this information will be of some service, we are,

Yours, very truly,

C. J. LINCOLN Co.

Mr. CARL J. BAER,
Secretary Chamber of Commerce,
Little Rock, Ark.

DEAR SIR: Replying to your inquiry as to the benefits to be derived from open navigation on the Arkansas River, in my opinion from 29 years' experience in business in Little Rock, Ark., the benefits would surely be very many to all the people all along the line. For instance, take the items of field seeds and grain that are largely transported from St. Louis, Mo., Louisville, Ky., Cincinnati, Ohio, Evansville, Ind., Memphis, Tenn., New Orleans La., and other river points. These items will not mix in carload shipments by rail, but by river can be transported at a much less rate, thereby securing to the farmer his seeds at a much lower price. Any detail information I have you are welcome to by only the asking for the same.

Yours for the building up of the productive end of the line, viz, the farmers and planters, I am,

Yours, very truly,

EDMOND CRAIG.

Mr. CARL J. BAER,
Secretary Chamber of Commerce,
Little Rock, Ark.

LETTER OF MR. L. M. GUTHRIE, ET AL.

OZARK, ARK., November 15, 1915.

DEAR SIR: We, a committee appointed by the Commercial Club of Ozark, Ark., to compile data showing the probable tonnage available to a regular line of river boats, beg leave to submit the following:

Cotton	-----bales	12, 000
Cotton seed	-----tons	30, 000
Hay	-----do	200
Peanuts	-----do	144
Irish potatoes	-----barrels	6, 000
Sweet potatoes	-----bushels	50, 000
Apples	-----do	27, 000
Peaches	-----quarts	960, 000
Coal, accessible to Arkansas River	-----tons	2, 400, 000
Stone, for riprap Mississippi River	-----do	120, 000

In addition to riprap stone we have within a mile of Ozark a very superior building stone in practically unlimited quantity.

Considering the fact that the demand for riprap stone is in all probability to be continuous until the millions of tons required for the Mississippi are supplied, and the further fact that the eastern parts of this State as well as the whole coastal plain are without building stone of any sort, it is only a question of freight rates that prevents our shipping an immense tonnage of building stone down the river.

Not being in position to obtain data as to general merchandise and other shipments received and shipped during the past year we do not undertake to furnish this information.

We have an undeveloped county that awaits cheaper freight rates on crude materials to reach its highest development. Provide the low rates of river transportation, and we will provide a generous share of tonnage to make it profitable.

Give us a chance to trade our apples for bananas, our railroad ties for hemp and jute, our cotton for sugar. Give us a chance at the Panama Canal; we helped to pay for it just the same as did the folks along the Ohio. Our great hardwood forests are rotting because wood is cheap and freights are high. Give us a chance to send a part of the wood Europe is going to need in rebuilding.

We have got a lot of stuff South America needs; give us a chance to trade with her. We have got a downhill run toward the world's markets, but the river is full of snags; help us get them out, we want to use that river.

Very respectfully,

MONTA ADAMS,
A. D. REYNOLDS,
L. M. GUTHRIE,
Committee.

Mr. CARL J. BAER,
Secretary Chamber of Commerce, Little Rock, Ark.

LETTER OF REYNOLDS REALITY CO.

OZARK, ARK., November 15, 1915.

GENTLEMEN: Not having an opportunity to meet with the committee that was appointed to gather information for the benefit of river navigation from Ozark and Franklin County, and of which committee I have the honor to be a member, I have undertaken to get up some data of shipments that could be controlled by reliable river transportation, with the following results:

From Ozark and Webb City:

Cotton	-----bales	12, 000
Cotton seed	-----tons	30, 000
Hay	-----do	200
Peanuts	-----do	144
Irish potatoes	-----barrels	8, 000
Sweet potatoes	-----bushels	50, 000
Apples	-----barrels	9, 000
From Franklin County: Peaches	-----cans	960, 000
Accessible to Arkansas River: Coal	-----tons	2, 400, 000

Not being in position to get the merchandise and other shipments received at these points during the year, I do not undertake to furnish this information.
Very respectfully submitted,

A. D. REYNOLDS.

OZARK COMMERCIAL CLUB, *Ozark, Ark.*

ESTIMATE OF NUMBER OF CARS OF FREIGHT SHIPPED TO MORRILLTON,
CONWAY COUNTY, ARK.

Flour -----	150	Vehicles and implements-----	20
Feed -----	150	Automobiles -----	10
Meal -----	50	Machinery -----	15
Sugar -----	25	Nails and wire-----	20
Oats -----	20	Dry goods, groceries, etc-----	400
Potatoes-----	10	Lumber-----	75
Bagging and ties-----	25	Oils and gasoline-----	40
Seed, rye -----	2	Drugs -----	15
Lard -----	30	Hardware -----	15
Meat -----	50	Brick and sand-----	50
Soap -----	6	Lime -----	15
Vinegar -----	3	Cement-----	10
Sugar -----	3	Tiling -----	10
Sirups -----	7	Hay-----	50
Cane and millet seed-----	3	Bagging and ties used at com-	
Salt -----	30	press -----	5
Rice-----	2	Logs -----	50
Fruit jars -----	3	Staves-----	20
Oranges -----	2	Cotton seed by boat-----	30
Bananas-----	5	Cotton seed by rail-----	200
Miscellaneous groceries-----	375	Furniture -----	10
Coal-----	200	Cotton into compress, 20,000 bales.	
Fertilizer -----	100		

Total of 51,220 tons per year.

ESTIMATE OF NUMBER OF CARS OF FREIGHT SHIPPED OUT OF MORRILLTON,
ARK.

Cotton seed-----	100	Cattle -----	100
Meal and hulls-----	300	Hogs -----	10
Cottonseed oil-----	20	Hay-----	20
Logs -----	100	Potatoes-----	5
Staves-----	10	Railroad ties-----	50
Junk -----	10	Fertilizer -----	30
Fruit-----	100	Rock -----	50
Strawberry plants-----	15	Cotton, 40,000 bales.	

Total tons per year shipped out of Morrillton, 28,400.

ESTIMATE OF NUMBER OF CARS OF FREIGHT SHIPPED TO PLUMERVILLE, ARK.

Meal and hulls-----	25	Miscellaneous cars -----	100
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Total, 2,500 tons.

ESTIMATE OF NUMBER OF CARS SHIPPED OUT OF PLUMERVILLE, ARK.

Cotton seed-----	50	Rock -----	50
Logs and staves-----	50	Cotton, 4,000 bales.	

Total, 4,000 tons.

ESTIMATE OF NUMBER OF CARS OF FREIGHT SHIPPED OUT OF BLACKVILLE,
ARK.

Cotton seed-----	5	Logs -----	50
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Total, 1,100 tons.

Estimate of number of cars of cotton, cotton seed, logs, railroad ties, and staves shipped from south side of river in Conway County and loaded at ferry, Houston and Adona, 100 cars.

W. E. DELONG,
*Member Board of Governors Arkansas River
Improvement Association, Morrillton, Ark.*

STATEMENT OF MR. H. F. AUTEN, PRESIDENT OF THE ARKANSAS RIVER IMPROVEMENT ASSOCIATION, OF LITTLE ROCK, ARK., AND PRESIDENT OF THE LITTLE ROCK PACKET CO.

SIRS: In compliance with your request for information as to the value of the Arkansas River as a means of transportation and commerce I herewith submit the following for your consideration:

While the Arkansas River Improvement Association is for the development of the commerce of both Arkansas and Oklahoma, as the State of Oklahoma has prepared and submitted to your honorable board their complete statements, through the commercial bodies of Muskogee and Tulsa, I will confine this statement to the State of Arkansas, with which I am familiar.

Arkansas in undeveloped resources is one of the richest States in the Union. It has within its borders not only a great volume of present commerce, but resources lie here waiting development far beyond its present commerce. The coal fields of Arkansas lying along the Arkansas River on both sides above Little Rock cover a territory approximately 100 miles square, and the coal underlying these fields varies in thickness from 2 to 9 feet. This coal field, so vast as to be spoken of as exhaustless, is lying practically dormant for want of transportation at reasonable cost. This coal is smokeless and ranges in fixed carbon from 75 to 84 per cent and has been by the United States Government pronounced equal to the famous Pocahontas coal used by the United States so extensively on its ocean fleets. The demand for such coal as this is practicably inexhaustible, and our coal fields, if the Arkansas River is made navigable, lie 1,000 miles nearer tidewater than the Pocahontas coal fields. In addition to this, with the Arkansas River made navigable, we have the markets of Little Rock, Pine Bluff, Memphis, New Orleans, and Vicksburg, and many other cities. It is not easy at first glance to decide why this high-grade coal in such quantities has not been mined and put upon the market, but a very slight investigation discloses the cause at once. The railroads penetrating these fields are charging rates for hauling the same two or three times as great as railroads hauling coal in more-favored communities. The freight rate from our coal fields, ranging from 60 to 125 miles from Little Rock, are from 90 cents to \$1.10 per ton, which, added to the cost of mining, makes the coal entirely prohibitive for manufacturing purposes. In the northern Central States, composed of Illinois, Indiana, and surrounding States, the rate for mine-run coal is 60 cents per ton for the first hundred miles, and slack coal is hauled a similar distance for from 30 to 40 cents per ton. Without going further, this explains the reasons why our vast coal fields lie undeveloped and will lie undeveloped until river transportation is an established fact. It also explains why we have practically no manufacturing done here. With river transportation, coal should be brought to Little Rock from our coal fields by boat at not to exceed 30 cents per ton on barges, which would permit this State to enter into active development and engage extensively in manufacturing the raw materials which are now lying useless.

Timber.—Arkansas has greater forests of yellow pine and hardwood than almost any other State in the Union. Take, for instance, our hardwoods, of which Arkansas has more than any State in the Union, and Little Rock, at the very center, has only three hardwood mills manufacturing this product, while Memphis, Tenn., on the Mississippi River, with river transportation and river rates, has 46; and yet we are located right in the heart of the hardwood-timber belt and would have short hauls to the factories and mills, while Memphis is out of the belt and has a much longer haul. The secret is that Memphis, with river rates, is able to manufacture successfully, while Little Rock, in Arkansas, without river rates, finds it impossible to manufacture at all. The three mills now located in Little Rock have been located here within the last 30 months, and it is yet a problem whether or not they can survive or whether they will be strangled by high freight rates. The world has been and is demanding this hardwood timber, and river transportation would not only give us a quick and easy way for handling it, but would give us such reasonable rates as would make the development of our lumber industry successful.

It will be recognized at once that the materials which I have mentioned are those which legitimately belong to river transportation. They are bulky, low-priced commodities, which the railroad can not profitably handle, and which ought naturally to be handled by boats, leaving the railroads to handle the higher priced freight, which could afford to pay the higher rates.

Bauxite.—Arkansas has located about 15 miles from Little Rock vast fields of bauxite ore, which have been in recent years partially opened up and developed by the Aluminum Co. of America. The reduction of bauxite is a very expensive process, requiring a large amount of capital invested in reduction plants and employing a large number of high-priced skilled labor and large quantities of coal for fuel. The reduction plant to which the bauxite from Arkansas is shipped for reduction is now located at East St. Louis, Ill. The history of the organization of this plant will illustrate the point I am calling attention to. The plant in question cost something like \$6,000,000 or \$7,000,000 and consumes from 600 to 1,000 tons of bauxite per day. The distance between the bauxite fields to East St. Louis is about 360 miles. As reasonable people, the Aluminum Co. of America, when they began to develop this Arkansas field of bauxite, looked to Little Rock or its locality as the natural site for the reduction plant. They found that the railroad rates for hauling coal from the coal fields adjacent to Little Rock were so high as to make the cost of production prohibitive, and they, therefore, decided to haul the raw bauxite 360 miles in order to get into a coal field which would produce cheap coal, because of lower rates of transportation on the Mississippi River. The plant was therefore taken away from Arkansas and our State left undeveloped and another great industry lost for Arkansas because we had no river transportation. The railroad rates in the recent past have been raised on the shipment of bauxite from \$1.80 per ton to \$2.20 a ton to East St. Louis, with the probability of still further increase. The present rate of \$2.20, so I am advised, is almost, if not quite, prohibitive, and the Aluminum Co. of America must either resort to river transportation to move its product from Little Rock, Ark., to East St. Louis or abandon the Arkansas fields of bauxite. In view of this condition, the Aluminum Co. of America has procured large fields of bauxite on tidewater in both France and South America, and they claim that should they not get river transportation in Arkansas to connect with the Mississippi, they can bring bauxite from France and South America by water and land it at their docks in East St. Louis at less cost than to bring it from Arkansas under present freight rates. It will thus be seen that unless we can get river transportation this great industry in Arkansas will be strangled like the coal and hardwood lumber industries. With river transportation the Aluminum Co. of America agrees to ship 400,000 tons of bauxite per year from Little Rock to East St. Louis by boat, and on returning haul coal from the cheap Illinois fields and merchandise from St. Louis and Memphis to Pine Bluff and Little Rock, which would give us cheap coal for manufacturing purposes and cheap transportation for the merchandise which we consume in such vast quantities. I have myself seen steaming coal delivered on the docks in East St. Louis from the Illinois mines at 45 cents per ton, including cost of coal and transportation, and the average price during the year in East St. Louis for steaming coal delivered on the docks is 70 or 85 cents per ton. This coal could be landed in Little Rock by boat far below the cost at which Arkansas coal is now being delivered.

The Aluminum Co. now employ in this State about 600 men in mining and shipping the bauxite and would in the future increase this very much. We are advised by the company that it will be necessary almost immediately to locate another reduction plant, which would probably cost in the neighborhood of \$5,000,000 or \$6,000,000 and employ a large number of men. With transportation on the Arkansas River the bauxite from Little Rock would be hauled by water to East St. Louis, and the boats returning would haul the cheap coal of Illinois back to Little Rock to supply fuel for the new reduction plant, which could then be erected in Arkansas, where it properly belongs. Had we cheap coal delivered here the same condition which would permit the Aluminum Co. of America to construct its new reduction plant here would permit other kinds of manufacturing to be installed and conducted here successfully, and the people of Arkansas would then find profitable employment, and the State would awaken from its dormant condition and make rapid progress in development. The supply of bauxite in Arkansas is sufficient to last, under present conditions, for probably four or five generations.

What will become of our bauxite and our coal and our timber without river transportation? The answer is simple. These industries will lie dormant and our people will be without employment and our State will remain poor for lack of reasonable transportation to bring about development.

Clays.—We are just entering upon a period of concrete construction. The Baltimore fire a few years ago demonstrated the fact that steel construction was not fireproof, and within the last five years the development of concrete construction is so great as to be marvelous, and it is safe to predict at the present rate of increase that 10 years from this time the cement business will be as great or greater than the steel business. Arkansas and Oklahoma have the great Portland cement clays of the South and West. The fields, while of great extent, are practically valueless to-day for want of cheap transportation. Like coal, bauxite, and timber, cement is a low-class freight, which can only be handled profitably by water. We have also extensive fields of granite, marble, and stones of the various kinds for all kinds of construction work; all bulky and naturally belong to water transportation. With reasonable river transportation all these fields could be developed and the 2,000,000 people of Arkansas made prosperous and happy. The agricultural products of Arkansas are matters of Government record, and I do not mean to refer to them except briefly. In 1914 Arkansas produced more than 1,000,000 bales of cotton, which, at the present price of cotton, would bring in \$75,000,000 and furnish a tonnage of 250,000. Three-fifths of this cotton is tributary to the Arkansas River. From the same crop is produced 500,000 tons of cotton seed, three-fifths of which is tributary to the Arkansas River, and the agricultural development of the State is just in its infancy. Less than 25 per cent of the tillable lands of Arkansas are under cultivation, and we may reasonably expect that the development of farm lands will increase rapidly with cheap transportation. Add to our cotton 5,000,000 bushels of rice, all raised along the Arkansas River, the hay, corn, oats, and other products, all of which are bulky material and would naturally be handled by river, and we have a commerce for the Arkansas River from this State scarcely equaled in any like-sized territory along any river in the world.

Why the river has not been used.—The question is frequently asked, Why do you not use the Arkansas River during the seven to nine months in the year when there is supposedly enough water for navigation? This at first glance in the face of constantly decreasing commerce on the river would seem to be a serious question, but when reference is made to the practical side of navigation it explains itself very quickly. People having quantities of merchandise or other products to be shipped to markets abroad, or to be brought to Little Rock from other markets, expect to have them transported at regular intervals, in order to meet their contracts, and while it is true that the Arkansas River at times during several months of the year has water enough to carry considerable transportation, the fact remains that the river is constantly rising or falling even during the period of high water and sand bars forming, so that in its present condition no shipper can be sure that goods which he orders concentrated at Memphis, St. Louis, or Little Rock, to be moved by boat 30 days hence will find the river in condition for transportation. A navigation company under present conditions of the river, even in high water, can not assure any shipper that a boat can make a trip from Little Rock to the mouth of the river or back again two or four weeks hence; consequently, neither the navigation company can take the risk of engaging in transporting the goods, nor can the owner of the goods take the risk of having his property tied up and fail to make delivery at the proper time.

Five years ago the citizens of Little Rock organized the Little Rock Packet Co. for the purpose of operating boats and carrying commerce on the Arkansas River from Little Rock to its mouth. I have been a member of that board of directors from its organization, and for the three years last past have been president of the company. We have demonstrated several things from our experience.

First. That with an open stream permitting boats to run even seven or eight months in the year transportation on the river would be exceedingly profitable at freight rates 20 to 25 per cent less than present railroad rates.

Second. The sudden building up of sand bars with the rise and fall of the stream has demonstrated that it is not safe to make any contract for more than 10 to 20 days in the future for carrying commerce, and that there is not 1 shipper in 20 that can avail himself of such a short-time contract, as it usually requires from 30 to 90 days for shippers to concentrate freight at Memphis, or from Mississippi River points. The shipper is, therefore, compelled to ship by rail, no matter how much greater the rates may be. While we could make a nice profit on a successful trip, our boats were so frequently tied up by sand bars in the river that we had to abandon the idea of making contracts in advance and have sold our boats until such time as there is a channel in the Arkansas River

reasonably maintained, which will enable us to make contracts for carrying freight.

Improvement of the river must precede commerce.—The sand bars in the Arkansas River frequently form when the river is at its highest stage, consequently there is no time in the year when a navigation company could safely undertake to transport freight more than a few days in advance; and it is, therefore, absolutely impossible to expect any transportation company to undertake to contract for hauling freight until the channel of the river is so prepared that shippers can have reasonable assurance that transportation will be regular and effective.

Cost of improving the river.—We do not advocate a hit-and-miss policy in the improvement of the Arkansas River. It would be a mistaken policy for the Government to depend upon dredge boats alone in opening and maintaining a channel, which may fill again within a short time, if this were the only improvement contemplated. There is no doubt the Engineer Department of the United States Government can work out a plan, possibly with dikes and jetties, which will construct a permanent channel, or something akin to a permanent channel, in the Arkansas River, from the city of Little Rock to its mouth, and this once done the cost of maintenance would be reduced to a minimum. The original cost would be paid but once and the annual maintenance being thus reduced would seem to be a sound business policy. The question arises, Would the commerce of the States of Arkansas and Oklahoma be sufficient to justify the United States Government in spending enough money to make a permanent channel? I recall that recently the United States Government made an appropriation of \$35,000,000 to build a piece of railroad in one portion of Alaska, a country which is sparsely settled and whose business will be confined largely to mining, which is at the present time in its incipency, and in a country which is frozen up nearly two-thirds of each year. If it is permissible for the Government to spend \$35,000,000 to build a railroad under such conditions, it certainly would be permissible for the Government to spend a like sum to build a road through the rich territory of the States of Arkansas and Oklahoma, with their 4,000,000 inhabitants, with undeveloped resources greater than any like territory in Alaska.

It would probably cost from \$20,000,000 to \$25,000,000 to construct a railroad through the State of Arkansas, basing this cost on the capitalization of the St. Louis, Iron Mountain & Southern Railroad, and such a railroad when constructed would only permit one company to haul commerce thereover, and yet private capital finds it profitable to spend this vast sum in such a project. If such a project can be made to pay by private individuals, then there can be no question of the propriety of the United States Government spending a like amount to open a natural watercourse through the State of Arkansas on which many companies could carry the commerce of this section to the world. We do not favor a hand-to-mouth policy on the Arkansas River. The people of this great territory, with the vast resources lying dormant which the world is demanding, such as coal, bauxite, timber, clay, cotton, hay, rice, wheat, oats, and corn, have the right to ask of the United States Government the same assistance and protection which it has granted to so many other localities and to give us transportation which will not only build up the Southwest but will save to shipper and consumer alike a large per cent of present transportation charges and permit manufacturing, mining, and other lines of industry to develop. It will, therefore, be seen that while the present commerce on the Arkansas River is practically nothing, the commerce which would be on the river were the river in condition to be used, would be probably not less than from three-fourths of a million to a million tons per year from the time transportation on the river was assured. We have at the very outset the Aluminum Co. of America, which offers to contract to transport from Little Rock to East St. Louis 400,000 tons of freight per year, and the Aluminum Co. of America is a concern fully capable of carrying out its contract. Added to this would be the coal and general merchandise to be returned from St. Louis for the Arkansas River trade, which is estimated at not less than 200,000 tons per year. To this may be added the coal from our own coal fields, hardwood and pine timbers, clays, granite, and different kinds of stone, in addition to agricultural products, and it will be seen at a glance that an estimate of a million tons per year is within reasonable bounds.

Will the river be used?—The reason the Aluminum Co. of America offers the transportation of 400,000 tons per year is because it can be handled by river cheaper than by railroad, and what is true of bauxite is also true of all the bulkier classes of freight which I have named, and human nature is so constituted that men will make contracts which are most profitable to them;

hence if the river was navigable, the products which I have mentioned would be handled by river instead of by railroad. In this we do not mean that all the products would be handled thus, for it is likely that the railroads would reduce their rates on such commodities and handle some part of this commerce, but increased shipping facilities and lower rates would mean more rapid development and more rapid increase in commerce, and there would be enough to tax both railroads and river shipping facilities.

Respectfully submitted.

H. F. AUTEN.

The BOARD OF ENGINEERS FOR RIVERS AND HARBORS.

PUBLIC HEARING OF THE BOARD OF ENGINEERS ON RIVERS AND HARBORS WITH REFERENCE TO THE IMPROVEMENT OF THE "ARKANSAS RIVER, ARK. AND OKLA.," CALLED FOR BY THE RIVER AND HARBOR ACT OF MARCH 4, 1915, HELD AT THE CHAMBER OF COMMERCE, LITTLE ROCK, ARK., NOVEMBER 16, 1915, AT 10 O'CLOCK A. M.

Col. W. M. Black, Corps of Engineers, chairman.

Col. F. V. Abbot, Corps of Engineers.

Col. John Biddle, Corps of Engineers.

Col. Harry Taylor, Corps of Engineers.

Col. H. C. Newcomer, Corps of Engineers.

Lieut. Col. C. A. F. Flagler, Corps of Engineers.

Col. BLACK. Gentlemen, please come to order. This hearing is the result of the following section of the river and harbor act of March 4, 1915: "Sec. 14. That the following projects now under improvement shall be reexamined, in accordance with the law for the original examination of rivers and harbors, with a view to obtaining reports whether the adopted projects shall be modified or the improvement abandoned * * * the Arkansas River, Arkansas and Oklahoma * * *."

On August 7 the following notice was sent out: "Examination of Arkansas River, Ark. and Okla. Sir: The report on the examination of the project for improvement of Arkansas River, Ark. and Okla., made in compliance with section 14 of the river and harbor act of March 4, 1915, has been reviewed by the Board of Engineers for Rivers and Harbors, whose conclusions are unfavorable."

I suppose you know that there is a certain procedure followed in all cases of this kind, of examination and surveys. The order for the examination is sent to the district officer; he makes the examination and reports, through his division engineer, who makes such comment as he sees fit. These papers are then sent to Washington and are referred to this board by law. They report on it, and their report, with all the other papers, go to the Chief of Engineers, and are transmitted by the Secretary of War to Congress, with such recommendations as the Chief of Engineers and the Secretary of War see fit to make. In the cases of unfavorable recommendations or unfavorable findings, a notice is always sent to interested parties, as it is termed, in order that they may make an appeal, so that the question may be fully heard and determined before the final report is made to Congress; and, you know, Congress takes final action according as it sees fit. Whether the report be favorable or unfavorable, Congress is entirely free to act exactly as it desires. We are simply a body that they have appointed to make examinations and give to them our best judgment in the matter.

Excerpts from the board's report are as follows: "It will be seen that the commerce has been decreasing and now amounts to only about 55,000 tons, a large part of which consists of forest products, which can usually be handled at medium and high stages without improvement. Gradually, the large vessels which formerly navigated this river have disappeared and the little business that is now done is by a few small boats operating over short distances. The history of navigation on this river is similar to that of many other shallow western rivers. In early days, when these waterways afforded the best, if not the only means of transportation, they were used to the limit of their capacity. Their improvement was undertaken in aid of the general progress and development of a pioneer country, and the expenditures brought abundant returns and were fully justified. Transportation follows largely the lines of least resistance, and it was found advantageous to abandon the river with the coming of rail-

roads, and this has been done almost to the complete desertion of this waterway, although the adjacent country has greatly developed and the amount of transportation required is many times what it was when navigation flourished years ago. Experience has shown that it is impracticable to secure any permanent improvement of the navigable capacity of the river except at a cost incommensurate with the present benefits. The least expensive method is snagging, and as it happens, this is essentially the first step to be taken in connection with any method of improvement and is necessary to permit the use of the natural channel even for the small present commerce. It seems desirable to keep the river open in aid of this commerce and in the hope held by many that there will be a revival of traffic on these waterways in the future. In view of the above, the board concurs with the division engineer, and recommends legislation authorizing the transfer of the dredges, without charge to some other improvement and a modification of the existing project, so as to limit the work to snagging the river from its mouth to Ozark, at an annual cost of about \$35,000, until such time as the needs of navigation shall warrant more extensive operations." We were requested to have a public hearing here in the city of Little Rock so that interested parties might have an opportunity to submit any statements, facts, or arguments deemed pertinent concerning the necessity for continuing the project, and, in accordance, notice was sent out and advertised. A copy of the notice sent out is not here this morning but may be seen at the office of the district engineer at Little Rock, as also may be seen there the list of the persons to whom the notice was sent, and I think you will find that all publicity possible was given to it.

We will now be very glad, indeed, to hear from you gentlemen any statement you desire to make, and I will ask Mr. Auten to take charge of the hearing and call up the speakers in succession in order that the case may be presented with some degree of sequence and order. When you speak, gentlemen, please speak clearly so that the stenographer will be able to record all that you say, for that record forms a part of the permanent record in this case, and may be published. In addition to that, please state clearly your name and what corporation or business you represent.

Mr. H. F. AUTEN. Gentlemen of the board, it is a real pleasure which the men of Little Rock and of Arkansas have in welcoming you here to make an investigation of the Arkansas River. Not only that, but we welcome you here because we are pleased to show you the courtesy for which our city and our State have been known for many years, and we are glad to entertain you; but, beyond that, we are glad that you are here for a serious, everyday, workaday purpose, to work out the problem which means the salvation of three or four millions of people along this Arkansas River in this valley.

For more than a quarter of a century, Senator Clarke, and, among other men, myself, in a small way, have been working to develop the State of Arkansas, and you will hear from these men to-day the efforts which have been put forth, from the different witnesses who will appear before you.

In reply to the senior member's suggestion of the notice, we beg to say that the notice was ample. It was received by our people and passed up and down the river and every one has had ample notice through the courtesy that you have tendered us, so we are here to-day with such information as we have been able to procure, and we will present it as best we may.

We have with us this morning at this hearing a gentleman of whom the State of Arkansas is proud, one who has been an honor to the United States Senate, the chairman of the Committee on Commerce of the United States Senate, the committee which deals with this great question with which you gentlemen are also connected; and I desire first to ask Senator Clarke to present this matter in his own way to you, as he may see fit.

Senator JAMES P. CLARKE. I expect to have the privilege of speaking about this matter before your board in Washington City, therefore I shall not consume any time here covering matters that can be more intelligently covered by what may be termed the witnesses, because, I take it for granted, the prime purpose of this investigation is not to be lectured about matters of policy or the professional aspects of the question, but to deal with such facts as would have a tendency to show that the report of the district engineer is erroneous.

The criticism I have to make of the report is that it starts at the beginning and ignores all that has been heretofore done in connection with this river. It has been repeatedly surveyed by the ablest men in the engineering service of the United States. In 1900 a report was made by Col. Stickney, captain then,

now Gen. Sibert, and Capt. McGregor. It went over the river in all its aspects practically as far back as the history of the river. Its rapidity and attributes are discussed, and it is the last work on the subject—as thorough as could be made now. The larger project mentioned in the report called for an expenditure of \$22,000,000, which was out of the question, but there were alternate suggestions which are worthy of attention. In the light of that report and the possibilities of improvement, river interests became active and again called the matter to the attention of the War Department, and another board was sent down here. They made a recommendation that two dredge boats be provided of modern type, especially adapted to this particular work. It was conceded that the larger project, while professionally feasible, was not commercially justified. Gen. Marshall took the matter up, went over it, and made his recommendations, in which he cordially approved that project, taking the river up in sections, beginning with the section from Little Rock to the mouth, and making an effort in a practical way to dredge out a channel of $3\frac{1}{2}$ or 4 or 5 feet from here to the mouth of the river. It was one of those things which could not be so definitely forecasted by mere professional opinion, but it was worthy of practical exploitation up to that point, and if the river was to be made navigable at all within the limits of permissible cost it was through the agency of this dredging process. The dredges were authorized, I think, in 1907; they have been at work for a year. I doubt if they have done 30 days' continuous, actual work for which they were constructed. But I give that as an opinion. I know they were not continuously employed, because the water has been up and down. It was either too low or too high; something was the matter that the plant was not capable of being used. The river is made up of pools. There are shallow places in it which prevented them getting from one place to another. This filling had been going on for 30 years, and the hope has been that the dredging process would equalize the bottom somewhat, so that boats could pass over it, and once they began to travel it it would be more easily dredged than it would be when they first undertook dredging it. It was realized that this couldn't be done at once, but would require a reasonable amount of time for that purpose.

Now, as I say, my criticism of this report is that, without a word of comment, it just casts aside all that has been done by the able men of the department who adopted as a policy the proposition of improving this river in sections; that the dredging process would give us a navigable depth to the Mississippi River, then it was reasonable to show that they could carry it up the river as far as Ozark. I think the subsequent report suggested as much. I suppose, and have supposed since, and am going to continue to suppose, unless this board knows something to the contrary, that there isn't anything to justify such a sudden, radical departure from the policy adopted by the department, because I take it that while the personnel of the board changes it isn't the policy of the board that comes in to revolutionize everything that everybody has theretofore done. The length of time that the boats have been on the river has been so brief and the amount of work that they have had an opportunity of doing has been so meager that I don't believe a conscientious body of public officials, such as I know this board to be, will say that because we had only 55,000 tons on the river last year the whole thing must go by the board. The very fact that we are calling upon the Government to improve the river shows it isn't in navigable condition now. The boats are not running up and down it. That goes without saying. Of course, the scheme presents itself in several aspects—the question of policy, how far the United States Government wants to go with improvement; the professional question of how far it is feasible, that's for you gentlemen to say; the commercial question, that's for the people to say. Would you patronize the river if you had it? Have you got anything to patronize it with? Is there any reason for it? The Government isn't called upon to expend money to make theoretical rivers. I am thoroughly committed to reform along that line.

There are millions of dollars scattered over the United States not doing any good except to improve the political prospects of some party. I have been aware that, whether from oversight or whatever it is, there comes up to our committee recommendations that seem to me to be discriminatory. Some things that are not half so worthy as other things are recommended where others things are not recommended. If it is the policy of this administration and of this board to adopt a more rational, businesslike system, I shall aid them in their efforts to do so, and if, after a fair test, the Arkansas River falls under the condemnation of any rule that has been adopted and will be uniformly applied, I will stand as religiously for that as any other; but, when I am

backed by such reports as the two I have called your attention to—and the policy was reasonable of digging out this stretch of 173 miles of river from here to the Mississippi River—I believe I am justified in showing some earnestness and protesting with some emphasis against the report made, and which is now under consideration by you. They have not tried to dredge it. They have accounted for that in various ways. There may be professional reasons why those dredges have not been more actively employed than they have been, but it would be in the nature of an outrage to take them away from there now with so little work done, and in the face of the showing that I am satisfied those in charge of the commercial aspect of the project will make.

The recommendations of the board, approved by Gen. Marshall, have just begun to be applied. They knew the condition of the river then, they knew the condition of its commerce, and the hope was expressed that they could so improve it that there could be a commercial tie established between here and the Mississippi River, and ultimately up the river. It's a pretty good river from here down, it's a pretty good river above—as rivers go. Changes are taking place in the rivers, but boats are being adapted to more shallow stages. A great many reforms are taking place. Those who are in a position to speak authoritatively tell you the tonnage is here. One fact is that the Mississippi River is the western boundary of the eastern freight zone. Little Rock is just within the western zone. Those are not the terms, but they definitely describe it. Immediately you cross that line, the freight rates come up from 30 to 300 per cent. Memphis has an advantage of this town of 30 per cent, although they are practically in the same territory. If this river was in a boatable condition, the wholesalers or jobbers of this town could either get the benefit of the Memphis rate or have their freight shipped to Memphis over the railroad and get the benefit of the river rate and bring it around here by boat for a small fraction of what they are compelled to pay.

This city as a distributing point for merchandise and that kind of freight the year around is peculiarly well suited for experimentation along that line, and I do not believe that the project, which has been recommended by Gen. Marshall and his associates, is an extravagant one. The two boats are here; they are paid for; they are at work; \$193,000 was set aside last year for their operation, and that was done by the engineers and not by Congress. The filibusters defeated the appropriations. The bill was passed by the committees, but it was impossible to get it out under the "pork-barrel" system. If the shaking up that that business has gotten in the last two years or in the last two Congresses will result in a more careful discrimination in these objects, I think a very substantial result has come from it. I don't want to charge anybody with unfair discrimination against us, but we do know that we haven't been getting what we were entitled to, and I don't think that, after years of effort—the board having adopted a plan as modest as that one—that somebody, who has never made his presence known in this city when he made his report—it wasn't made by Maj. Putnam, as we are advised, or by Mr. Van Frank, but some other official equally as conscientious, I suppose. I am not saying anything about that, but he didn't consult local interests, as far as I am able to determine, and he either wrote it in his office or some similar place. Of course, if he took the history of the stream as laid down in current histories, his statement is correct. I am not combating the official, but I am combating the proposition that it isn't a river that is navigable. The appeal we make to Congress is for improvement.

When I get to Washington I will go into certain phases of this matter more fully and if there is anything further that I can submit to this board I will be glad to submit it.

Col. BLACK. The board will be very glad to see you then, Senator.

Mr. AUTEN. There are delegations here from several cities along the river. I will ask Pine Bluff, which is represented here by a delegation of about 15 or 20 men, to have their representative come forward. I will say that, inasmuch as there are about five or six districts to be heard from, it will be necessary for us to limit our time to probably 30 minutes to each city. Will that be sufficient, Mr. Bloom?

Mr. E. B. BLOOM. I think so.

Mr. AUTEN. This is Mr. Bloom, of the city of Pine Bluff, representing the chamber of commerce of the city of Pine Bluff, which is just down the river.

Mr. E. B. BLOOM. Gentlemen, I take it it will not be necessary for me to take up but just a minute or two of your time to state the facts that we have, and I presume that is what you gentlemen want.

I want to say, to start with, that Pine Bluff, of course, is deeply interested in river navigation, and we have had in navigation down there, continuously for two or three years, two boats, one, the steamer *Lightwood*, that runs from Pine Bluff to the mouth of the river regularly once a week and return. At the mouth of the river she connects with the Memphis Packet Co.—the Lee Line of steamboats. Coming this way, or west, we have the steamer *Ralph Hicks*, that makes two to three trips a week. Those boats have been fairly well patronized, but not so much as they would have been had we had permanent and dependable river navigation.

I have, at the suggestion of the president of the Arkansas River Association, attempted to compile some tonnage statistics, and in doing so I have only gone to those merchants and planters whom I believed we could absolutely rely on for the tonnage that they state they will give to steamboats provided there is certainty of river navigation. We will be glad, of course, to submit these letters to the board—file them with the board, if they desire them—and, upon investigation, I believe they will conclude that the statements made by those merchants and planters can be absolutely relied on.

Just as a sample of the letters we have taken, I would be glad to read one from the Union Seed & Fertilizer Co., of Pine Bluff, who have oil mills throughout nearly all of the Southern States. They write as follows:

Mr. E. B. BLOOM,
Secretary Chamber of Commerce,
Pine Bluff, Ark.

DEAR SIR: Replying to your several requests asking for information regarding the tonnage of cotton seed and cottonseed products by boat on the Arkansas River in and out of Pine Bluff, we have to say that during the season of 1913-14 we received 600 tons of seed by river, and during the season of 1914-15 only 400 tons by the same source. However, had there been sufficient water, or had the channel been in shape to receive the boat regularly, we would have more than doubled this tonnage, but owing to the poor river service we were compelled to haul this seed by wagon and rail instead of by water. If the river was in condition to transport freight from Pine Bluff to Little Rock and from Pine Bluff to the Mississippi River, it would give us a chance to use the water route for all of our export business from both our Little Rock and Pine Bluff mills, but, as the condition has been so bad for several years past, it has been impossible to handle freight through this source.

UNION SEED & FERTILIZER Co.,
By ITS MANAGER.

Compiling the tonnage statistics from just such letters and promises as that, we are prepared to say that the tonnage out of Pine Bluff—in and out—would amount to 147,322 tons per annum. That consists of cotton and cottonseed products, furniture, hardwood, and the regular lines of merchandise.

I believe that's about all that I can say that would be of any benefit to the board, except to add that I don't believe the dredge-boat system has been given a proper opportunity to show what it could do in the Arkansas River. I make that statement not from personal knowledge of just what the boats have done, but from personal knowledge of having seen those boats come to the wharf at Pine Bluff some time in October, I think—one of them—1914, and the other one along about January, 1915. Those two boats then remained at the wharf in Pine Bluff until August, 1915, with apparently nearly full crews on both boats. During the month of August they were sent down the river with, as I understand, full crews. At a little meeting held at the Chamber of Commerce of Pine Bluff in August, which Maj. Markham, of Memphis, attended, he stated that up to that time of the appropriation that had last been made by Congress for this work \$90,000 had been expended. Of course, that struck us as being an expenditure of money for boats that were laying at the wharf. If that's true, then I feel that I am justified in saying that the dredge boats so far haven't had an opportunity to show what they can do.

Now, Mr. Chairman, we have with us Mr. Taylor, the traffic manager of our organization, and I would be glad to have him present to you a few things in regard to the saving of freights, should the channel of the Arkansas River be opened.

Mr. AUTEN. Mr. Taylor will please come forward. He is traffic manager of the chamber of commerce, Pine Bluff.

Mr. W. M. TAYLOR. Mr. Chairman and members of the board, I have prepared several exhibits and I will just file them with the board's stenographer so he can use them without writing them down. (See Exhibits A, B, C, D, and E.) But I would like to recite a few of these figures to show some of the effects of water competition on rail rates. I have prepared one exhibit here that shows the present rail rates and the boat rates from river points to Pine Bluff. Now, as Mr. Bloom told you, we only have the one boat that runs from Rosedale, Miss., up the river to Pine Bluff. It is practically impossible under the present condition of the river to operate north of Pine Bluff, but this boat has been in continuous operation. It makes a trip every week and has failed just one week this year in making the trip, due, I think, to the high water making it practically impossible to make its way landings. The great majority of its freight, of course, comes to Pine Bluff at the present time. We are restricted to traffic that moves from river points, and in moving it from river points—Memphis, St. Louis, Cincinnati, Louisville, and Evansville, possibly—it has to move over three boat lines to get into Pine Bluff; therefore the cost of operation is considerable. The present rail rate from Cincinnati is \$1.219—these are the first-class rates—and the river rate is 75 cents; the second-class rate by rail is \$1.026, and the river rate is 65 cents; the third class, 78.2 cents as against 50 cents; the fourth class, 59.8 as against 40 cents. From Memphis the rail rate is 70 cents as against 45 cents; second class, 60 cents as against 35 cents; third class, 45 cents as against 30 cents; fourth class, 36 cents as against 25 cents. The river rates run from 20 to 75 per cent lower than the rail rates, and we have estimated that the saving to Pine Bluff in the last year—and the last year has been a considerable increase over the tonnage that moved previously, due to the fact that the boat is now operated possibly in a little different manner from what it was before—that we have saved about \$4,000 in the tonnage that comes to Pine Bluff alone. Of course, if the work was stopped on the river and the boat had to go out of business we would lose that.

I have prepared another exhibit that shows the class rates from St. Louis to Pine Bluff and Little Rock. They are the same. Pine Bluff and Little Rock are on an equality in the matter of freight rates from all of the points of origin or manufacturing centers.

The first-class rate for 358 miles by rail from St. Louis is \$1 to Little Rock and Pine Bluff. In comparison with that rate for the same distance, to show the discrimination that exists in this country as regards freight rates and the evident necessity for some compelling force to give us a method of getting commodities in here that will put us on an equality with the river country, I want to compare that rate of \$1 for 350 miles from St. Louis to Pine Bluff with various rates. To Topeka, Kans., 345 miles, the first-class rate is 80 cents; to Emporia, Kans., 392 miles, 96 cents; to Lincoln, Nebr., 491 miles, 65 cents; to St. Paul, Minn., 576 miles, 63 cents; to Duluth, Minn., 686 miles, 78 cents; to Mobile, Ala., 866 miles, 90 cents; to Pensacola, Fla., 761 miles, 90 cents; to New Orleans, La., 701 miles, 90 cents. I have simply read the first-class rates, but the exhibit shows all the class rates, and I have also given here on this the tariff reference that can be used in referring to the tariffs, should care to take it up. For instance, the Interstate Commerce Commission, in deciding a case as to what the rates should be from St. Paul to points in North and South Dakota, territory that is practically the same, as regards the methods and cost of handling transportation, as it is from St. Louis to this territory—the commission decided that for a distance of 360 miles, the same as from St. Louis to Pine Bluff and Little Rock, the first-class rate should be 89 cents, as against our rate of \$1. They also decided a case of transportation from Iowa to Kansas and Nebraska points, 360 miles, 86 cents, as against our \$1 rate. The rate in the State of Texas, made by the Texas railroad commission, where the cost of transportation is evidently more than it is in this territory, for the same distance is 80 cents; in the State of Oklahoma, 85 cents. In the State of Arkansas the first-class rate is 82 cents.

Of course there are many arguments, pro and con, as to the reasonableness or unreasonableness of these rates, per se, as they put it, but that shows, anyhow, that we are evidently discriminated against in that fashion.

I have another exhibit that shows possibly the effect of water competition on rail rates more than any other, and while it may not be plainly understood from a reading of it by yourselves, I can explain it in this way: I have taken the territories from which we get practically 90 per cent of what we consume

in this country—from Buffalo, Detroit, Cleveland, Dayton, Cincinnati, Kansas City, and St. Louis. The distance, for instance, from Buffalo to Memphis is 815 miles. The distance from Buffalo to Pine Bluff and Little Rock is 952 miles. The first-class rate from Buffalo to Memphis is 91 cents per 100; the first-class rate to Pine Bluff and Little Rock is \$1.527 per 100. For a difference in distance of 137 miles, the difference in the rate is about 63 cents. The rate per ton per mile from Buffalo to Memphis is \$2.23; the rate per ton per mile to Pine Bluff and Little Rock is \$3.20, showing that the Mississippi River absolutely controls the basis of the making of freight rates. Now if there was no Mississippi River, or, in other words, if Arkansas River navigation had the same effect and force as the Mississippi has had at Memphis, and you were to apply the rate per ton per mile to Pine Bluff and Little Rock as is applied to Memphis, our first-class rate from Buffalo to Little Rock and Pine Bluff would be reduced 46½ cents per 100, or \$9.30 per ton less than it is now—a saving, mind you, of \$9.30 a ton in a haul of 135 miles. The same thing from Detroit shows that we would save 35 cents per 100, or \$7 a ton; from Cleveland, 35 cents per 100, or \$7 a ton; from Dayton, Ohio, 40½ cents per 100, or \$8.10 a ton; from Cincinnati, Ohio, 26 cents per 100, or \$5.20 per ton; from Kansas City, 25.1 cents per 100, or \$5.02 per ton; from St. Louis, about 24 cents per 100, or \$4.74 per ton.

On October 1, 1914, the traffic bureau of the Chamber of Commerce of Pine Bluff filed with the Interstate Commerce Commission a petition asking that the commission require all boat lines that run from Memphis—we use two boat lines at the present time—we asked the commission to require the railroads that run from the east and originating territory to join in with the boat lines from Memphis to Pine Bluff in the establishment of through rates. That would mean that a man at Buffalo or Pittsburgh, or Atlanta, Ga., could go into the freight depot and bill his goods direct to Pine Bluff at a river-and-rail rate, whereas he bills it now all-rail. They have that same arrangement to New York and many other points. We want the same rate to Pine Bluff territory. We believe if we could get that arrangement that would open up to us a way to move traffic by the river and naturally secure lower freight rates by reason of lower cost of transportation over the river.

The reason we filed that petition asking the commission to require the boat people and the railroads to admit that they were common carriers alike was because of the section of the Panama Canal act that amended section 6 of the act to regulate commerce, giving the commission authority to require this to be done and to say that a boat line was a common carrier. We have had this case heard by the commission. We went to considerable expense. We set forth in that petition to the commission all of the various aspects regarding the movement, the physical connections at Memphis and at Rosedale, Miss., and we have put it up to them in oral argument at Washington. We have gone to all that expense.

We were backed up in our application by various decisions that were made immediately after the passage of the Panama Canal act on various applications that were made, for instance, the Decatur Navigation Co. *v.* Louisville & Nashville Railroad, the Chattanooga Packet Co. *v.* Illinois Central Railroad Co., the Tampa Board of Trade *v.* Louisville & Nashville Railroad et al., the Bowling Green Business Men's Club *v.* Evansville & Bowling Green Packet Co., and the most recent case that has come up in connection with the same is the Kansas City Missouri River Navigation Co. *v.* Chesapeake & Ohio Railway. In that case, which was exactly similar to ours, the commission decided in favor of the Missouri River Navigation Co., giving them through rates through to the coast on export grain. This case, as I say, has been submitted to the commission, but we are yet without a decision; but, of course, if the commission were to learn that work had ceased on the river, naturally they wouldn't feel justified in requiring the carriers to join in with a boat line that was physically unable to operate. We have estimated if we could have this highway opened up, this natural artery of commerce, that we would save at Pine Bluff, as a distributing center for the surrounding territory—and we supply 16 counties—possibly 20 per cent in freight charges, a saving to the community served by Pine Bluff as a jobbing center—this is only an estimate—of from \$50,000 to \$100,000 per year. For instance, to tell you what it would mean, or to give you an idea, the present rail rate from New York City to Pine Bluff, first-class, is \$1.70. The ocean-and-rail is \$1.27. That is the difference between all-rail rates and water-and-rail rates—\$1.70 as against \$1.27.

I have attached hereto a copy of the petition we filed in the case, together with a statement of the various freight rates applying and the various tariffs as compared with the boat rates.

Col. NEWCOMER. May I ask you, in that connection, if that decision is favorable, would the rates from Pine Bluff to those points be the sum of the local rates or be less than the sum of the locals?

Mr. TAYLOR. That is possibly a point on which the decision will hinge. For instance, from Pittsburgh to Pine Bluff, the through rail rate is \$1.50. It is a fraction over \$1.50. What does the railroad company get to Memphis out of that \$1.50? They get less than their local to Memphis. We are asking that they take that same proportion of the the through rate and add it to the boat rate to determine the through river-and-rail rate, necessarily making a lower rail-and-water rate than the present rail rate.

This steamer *Lightwood* that we are operating and are doing everything in the world to give tonnage to, we are able to give it less tonnage by reason of the necessity of operating over three boat lines. But in the last year this boat, which has a capacity of 150 to 200 tons—a wooden boat—some of them call it the *Driftwood*, but it's a mighty good little boat, at that—it has a draft of only 30 inches, and it takes a very light draft boat to operate now—it has made 50 trips up and down the river in the last year, 100 trips altogether—it has handled 12 tons of brick, 1,400 tons of cotton, 1,000 tons of cotton seed, 15 tons of cotton-seed meal, 190 tons of corn, 100 tons of hay, 600 tons of lumber, 4,588 tons of merchandise, 180 tons of oats, 40 tons of potatoes, 1,600 tons of rice; a total of 10,125 tons during the last year.

Col. NEWCOMER. Is the boat rate from Memphis to Pine Bluff, involving two boats, less than the rail rate?

Mr. TAYLOR. I have all of those figures tabulated here for you.

Col. NEWCOMER. The point I had in mind was, is there any substantial increase in shipments from Memphis to Pine Bluff by boats?

Mr. TAYLOR. It is very substantial. In fact, all of the larger merchants in town ship all of their less-than-carload stuff by boat. Of course, they have to take into consideration the longer time it takes to move. The comparison of the rates is this: The first-class rate by boat is 45 as against 70 by rail.

Col. NEWCOMER. Is that less-than-carload?

Mr. TAYLOR. Yes; taking the class rates. The first-class rate always applies on less-than-carload commodities. The second-class rate is 40 as against 60.

Col. NEWCOMER. You gave those before?

Mr. TAYLOR. Yes, sir.

Col. NEWCOMER. But, then, I understood you to say that on commodity rates, for instance, the boat rate was greater than the carload rate?

Mr. TAYLOR. Yes; it can't handle—the reason for that is, as you well know, that a carload shipment is loaded by the man that ships it and it's unloaded by the consignee, but the boat people have got to load everything and unload everything, and they can't compete with the very low carload rates under present conditions. Undoubtedly if this boat had plenty of channel to handle out of Pine Bluff the product that can move out and go all the way to Memphis without stopping, it could bring back stuff at one-third the cost it will bring it back now.

Col. BLACK. What channel depth do you think will enable you to operate?

Mr. TAYLOR. I am not competent to state.

Col. BLACK. Is there anyone who is?

Mr. TAYLOR. Yes, sir; we have several practical steamboat men with us.

Col. TAYLOR. Your expectation is, if the improved channel is made, it will meet with the lowering of freight rates by rail?

Mr. TAYLOR. No, sir; we have no desire at all to lower the freight rates by rail. Of course, we would gladly welcome that.

Col. TAYLOR. You spoke of the rates being discriminatory awhile ago—your rates very much higher than those to other places. You would like to have your rail rates reduced?

Mr. TAYLOR. Oh, undoubtedly.

Col. TAYLOR. That's really what you are getting at?

Mr. TAYLOR. Yes, sir.

Col. BLACK. Be careful about that answer. I don't think you intended to say what you did.

Mr. TAYLOR. At the same time we would intend to use this river as a common carrier, the same as we now use the railroads, in the shipment of through routes. Just as I tried to explain, whatever the effect is on these rates from

St. Louis, Memphis, or any other points that are two or three times as far away as Little Rock or Pine Bluff—whatever that effect is, it establishes rates that are 80 cents as compared with our \$1, or 65 cents as compared with our \$1, and we can lay it on to nothing at all except the force of river—possible potential river—competition.

Col. FLAGLER. I would like to ask one question. In speaking of the discrimination in rates from St. Louis here you quoted a number of cases where they have lower rates into territory where there was no water competition?

Mr. TAYLOR. Yes.

Col. FLAGLER. What is your idea of the reason for the discrimination against you in favor of those places where there is no water competition?

Mr. TAYLOR. There are a thousand and one reasons, possibly, for nearly every rate; and the longer a man studies rates the more he learns about them and the less he thinks he knows. But, take any one of those points—take Topeka, Kans.—I should judge that the reason for that lower rate from St. Louis for the greater distance is that possibly the cost of operation from St. Louis to Topeka is lower; but is it lower in such proportion? The rate from St. Louis to Kansas City, 65 cents per 100 pounds, as compared with our \$1, was in the past forced by river competition, and that has some effect or bearing upon the rate to Topeka. Possibly the railroad that operates from St. Louis to Kansas City moves through Topeka. One of the lines does. Perhaps that has some effect on what the rate is to some intermediate point.

Col. NEWCOMER. Doesn't the volume of traffic movement affect the rate?

Mr. TAYLOR. Yes, sir.

Col. TAYLOR. The financial condition of the railroads down here isn't such as to indicate that they are getting rich at the present rates.

Mr. TAYLOR. We have no control over the things that happen in connection with the Rock Island and the New Haven. They have done many things that we shouldn't be called on to suffer for. We have undoubtedly been made to suffer and to pay for a great many sins. In connection with that rate to Topeka and those other rates we firmly believe that the Iron Mountain Railroad has made the people of Arkansas pay for the low rates through that country.

Col. ABBOT. Then, I understood you to make a still further proposition, and that is, supposing that the railroad rates remain as they are, that you would be able to ship by river to Memphis and take advantage of the lower rates that Memphis has to the East, and gain over what you can do now shipping by rail through Memphis to the East. I understood you to make that statement.

Mr. TAYLOR. In connection with this case that we have before the commission?

Col. ABBOT. No; in connection with the use of the river—that you could actually take your goods from Pine Bluff and ship them by river to Memphis and then transfer to rail and get a through rate in that way, even if the railroads and steamboats did not give joint rates, that would be less than you now have to pay by shipping all the way from Pine Bluff to the East by rail.

Mr. TAYLOR. I have made no comparison on that, but I should say this: That if a boat were justified and would haul sufficient tonnage to Memphis and haul sufficient tonnage from Memphis back, that that boat could make low rates enough to be able to break down that through rate or to make lower rates by reason of the very low rates out of Memphis.

Col. ABBOT. You say to "break down that rate." You prefer to ship by rail, but if they wouldn't break down, you would ship by river; is that the position you want to take?

Mr. TAYLOR. If we can save any money or extend our territory, we would certainly take advantage of the opportunity. At the same time, I am firmly convinced by the decisions the commission has made, and by the decisions made in other sections, and evidently the purpose of Congress in passing the Panama act and that part of it that gave the commission authority to say to a boat line, "You are the same as this railroad that runs parallel to you," and to say to the boat line, "You should consider this railroad in establishing through rates," and if that were done the actual lower cost of transportation by water would give us lower rates.

Col. NEWCOMER. By the way, do you have the boat rates in that schedule?

Mr. TAYLOR. Yes, sir.

Col. NEWCOMER. To Memphis?

Mr. TAYLOR. From all points to Memphis.

Mr. AUTEN. Gentlemen, I believe this concludes what the city of Pine Bluff desires to present to you this morning. We have with us the Hon. H. M. Jacoway, Congressman from the Dardanelle district, which is up the river just a little way, as you know, and he will present the matter for that district. Mr. Jacoway.

Hon. H. M. JACOWAY. Mr. Chairman and gentlemen of the committee, I don't know that I can add much to what has been said here by those who have preceded me, as a general proposition, relative to making the Arkansas River navigable, as outlined in various reports, as I understand. My presence to-day is to present as best I can the proposition as it affects navigation between Little Rock and Ozark, which lies in my congressional district, that of the fifth district.

Having been in the halls of the National Legislature for two terms or more, I have found it the invariable rule of the Committee on Rivers and Harbors and the like committee in the Senate when a project of this kind is proposed for serious consideration by the committee that the interrogatory that is presented ever and anon and on every occasion is, "What is the tonnage that you now have and what is the proposed tonnage that river navigation would develop?" I do not claim, gentlemen, to be a civil engineer—know nothing of it—but in that regard I want to say that the people who are interested in this project are relying in a great measure, if I might not say absolutely, upon the report made by your body in 1900, I believe, which report shows that it is feasible and practicable for the Arkansas River to be navigated from Little Rock to Ozark at least. So I stand upon that proposition to-day, because it has been worked out and thrashed out by civil engineers of note.

The next proposition that then submits itself to me for discussion is this: "What is the tonnage that the Arkansas River would develop between here and Ozark?" And that is answered, gentlemen of this committee, in figures, as I view it, and in terms most eloquent. I want to say, as suggested by Senator Clarke here, that I don't know who it was that made the report suggesting or intimating that the Arkansas River project should be abandoned. For one, I want to say to this committee that we would have invited and we would have welcomed that gentleman into our community and to any county in this district and shown him every courtesy, and have gone into details, and I believe that when we have presented the tonnage that we now have—the inchoate of prospective tonnage—that the opening up or prospective development of this river would show that he would unalterably have been driven to the conclusion that it is feasible and practicable to develop and navigate the Arkansas River at least between its mouth and Ozark nine months of the year, because the report as coming from your body lays down the proposition, not in terms dubious or uncertain but absolute, that in nine months of the year a channel can be maintained between here and Ozark of an average depth of $3\frac{1}{2}$ feet, and that can be done by a system of dredging, and I will add, parenthetically, that through the efforts of Senator Clarke and others in Congress two magnificent dredge boats lie here at the wharf, and, as I understand from river engineers—Capt. Evans, who is in this audience to-day, and who has navigated the river ever since 1852—that there are but 17 shoals between here and Ozark, which, if sucked out by these dredge boats, would give river navigation nine months in the year.

Now, in a little statement that I made sometime since, or an effort that I made in Congress trying to present this matter to the committee, relative to the tonnage which this river would produce—I want to invite the attention of the committee to those facts, which, I say, speak most eloquently—at least, from my viewpoint if not from yours—showing this condition of affairs as late back as 1906. In the biennial report of the Bureau of Mines, manufacture and agriculture for the State of Arkansas for 1905-6, the coal production of the State for that period is given as 1,875,569 tons, and that data was so accurately gathered that I can give you the distribution of it, and the distribution of that yearly output is as follows: In the county of Sebastian, 1,096,159 tons; in Franklin County, 339,449 tons; in Johnson County, 229,477 tons; in Polk County, 38,875 tons; in Logan County, 20,950 tons; in Scott County, 50,659 tons; stripped pits and smaller mines, 100,000 tons.

I will also say for the benefit of the committee that a gentleman who has been engaged in the coal-mining industry in this State for a number of years, Mr. Hoyer, who has operated these mines and knew of their output, will not only verify these figures but these figures will be greatly augmented as the result

of opening new mines since this biennial report of the secretary of agriculture was printed.

I will further invite the attention of the committee to a statement issued by the Little Rock Board of Trade showing the most important tonnage originating in this territory, which I will later append to my remarks.

Now, gentlemen of the committee, answering the interrogatory that the committees in Congress propound to you when you go before them asking for an appropriation at the hands of the Federal Government, that question which wants to be answered to the satisfaction of one great arm of this Government, the Engineering Department—what your tonnage is—I want to say that, lying along the stretches of the Arkansas River from this place where we now sit to Ozark, there is a proven coal field not estimated in any of this tonnage that I have given you, in which, if we had river transportation, there could be developed in a short time the magnificent sum of 200,000,000 tons of coal that could float down this Arkansas River to the markets of the world—most of it lying between here and the city of Ozark. I want to submit again that the freight rates to haul this tonnage to Little Rock and along the stretches of the Arkansas River are prohibitive. I think that I speak that which is exactly true if my information is correct—that the cost of hauling coal from Ozark down to Little Rock is \$1.25 a ton. If we could have the benefit of what is termed “used rivers,” according to this report that I now hold in my hand and invite your attention to, and which I will want to incorporate into my remarks—if we could have the benefit of used rivers, every ton of this coal could be laid down upon the wharves of this city, the capital city of this great State, at a cost of not exceeding 80 cents per ton; that, in so far as Little Rock is concerned, that would mean a saving to the city of Little Rock alone of the sum of \$187,000, in round numbers, every calendar year. That means, gentlemen of this committee, that if the city of Little Rock could have the benefit of used rivers—and she is entitled to it in every sense of the word, as I view it—that if she had the benefit of used rivers most of her industrial and commercial problems that now harass her, on account of cheap fuel that other cities get along the river, would be entirely solved. Summing up the little argument that I attempted to make in the Halls of Congress, it would mean, gentlemen of this committee, a saving in freight rates in the State of Arkansas in one calendar year of \$700,000.

I want to say that I am not an advocate of the “pork barrel” proposition, as suggested by the senior Senator from Arkansas, Senator Clarke. I believe that an intelligent, careful survey should be made of all of these projects that are presented to Congress, and those projects that are feasible and practical, eliminated from the “pork barrel” proposition, should be adopted by Congress and should be adopted by the Government and carried to successful termination; and I know of no project, according to facts and figures relative to the matter, that demands the attention of this Government more than the improvement of the Arkansas River, at least as far as Ozark, some 165 miles distant from where we are now.

An investigation of the committee of the lower branch of Congress will develop the fact that the great appropriations for the improvement of rivers are given to those districts which are represented upon the committee in the lower House. I know these gentlemen intimately and well. I am not on this occasion, and will not, impugn any motive they have, but I say to the board that if you will investigate the projects that have received the sanction of the Federal Government, even in the last bill as it went before Congress and was passed—and I don't think that I am mistaken—you will find that there is the solemn approval of the great arm of the Engineering Department of this Government laying its O. K. upon propositions that do not present the same possibilities and are not as dignified and as worthy of consideration, in my humble judgment, gentlemen, as is the improvement of the Arkansas River from its source up to Ozark. If you will examine this report, I think you will find that in one instance this great Government has made an appropriation to eliminate the wild hyacinths from certain streams in this country—more in proportion than they have appropriated money to improve this great stream.

I want to say, also, that I was born and raised up here in Yell County, some 75 miles distant. As a boy, I have seen 25 different boats bearing 25 different names docked at the wharves at Dardanelle, Ark., and making regular trips between Dardanelle, Ark., and the mouth of the Mississippi River, carrying thousands and multiplied thousands of tons of freight, and running regularly. On one occasion, as Capt. Evans here will testify, one boat

went out of the little city of Dardanelle loaded with 5,000 bales of cotton. Freight rates in those days were much cheaper than they are now. One class of freight rates—I couldn't tell you under what class it comes, but will incorporate it into my remarks, if allowed to amend them—that freight that we got at Dardanelle in those days at 23 cents, when we had the benefit of used rivers or used streams, since river transportation has been abandoned, the people along the stretches of that country, and especially at Dardanelle, pay 69 cents now instead of 23 cents per hundred.

Now as to the freight rates. As to what it would mean for Arkansas, I am going to call the attention of the board to the great discrimination that has been made in favor of Memphis as against Little Rock, and I think it is a proposition that should challenge the attention and consideration of the committee.

On certain freight rates from Little Rock to New Orleans the cost is 55 cents a ton; on the same class of freight from Memphis to New Orleans it is 25 cents a ton. From Little Rock to Boston it is 80 cents a ton; from Memphis to Boston, 55 cents a ton.

Col. NEWCOMER. Those are hundreds instead of tons?

Mr. JACOWAY. I mean per hundred, yes, sir; thank you. From Little Rock to New York, 75 cents; Memphis to New York, 50 cents. I will incorporate the balance of this table in my remarks when amended, but I recite those to show the great discrimination that has been made in favor of Memphis.

I don't know that there is more that I can add on this occasion except to say that emptying into the Arkansas River between here and Dardanelle is a little stream called the Petit Jean. In some instances it has been made light of, and it has been suggested that it would be ridiculous to make an appropriation for that stream out of the Federal Treasury, but I have had the facts and figures compiled as to the tonnage that would come down the little Petit Jean and float into the Arkansas if it could have a few snags drawn out of it, and those figures show that, emptying into the Arkansas River and coming to Little Rock and other points, there could be annually a total of about 75,000 tons additional acquired from that little stream alone.

Now, in conclusion, gentlemen, I want to again call your attention—it isn't necessary, because you are more familiar with it than I am, or anybody else—to the report made by the Federal Government upon the feasibility of the navigability of this stream. In so far as the interrogatory is concerned, which I think has been answered here by those figures, we have the tonnage, and if we can ever get the Arkansas River used again I think the tonnage will be more than has been suggested here by me to-day. I also want to say again that I think the report that is made looking toward the abandonment of this stream—and I say it with all respect—is unjust, it is unwarranted, and is not based upon the true facts. I say it with respect, and I believe that an investigation of the tonnage that we can produce here will show those facts beyond the peradventure of a doubt. So, relying upon the proposition and arguing from the premise laid down by the Federal Government, that this stream is navigable, and arguing that proposition in the light of the tonnage that has been suggested here by me and others, I believe that when the engineers of this Government have had the facts fairly and squarely placed before them they will be unalterably driven to the conclusion that this stream should have a dignified appropriation, year in and year out, and 3,000,000 people should have the benefit of this great stream and watercourse; and if the Federal Government will do that, in my judgment, it will be developed into one of the greatest and most dignified streams that ever bore the white sails of commerce to the seas.

Col. BLACK. How do you account to yourself for this decline in river navigation? The river is in practically as good condition now as it ever has been.

Mr. JACOWAY. I don't suppose it will be wrong for me to state this, but in talking to a gentleman who has been a captain upon the Arkansas River for a number of years, he said that it was the policy of the railroads to put competing lines upon the river here in the early days for the express and direct purpose of breaking down river navigation. I suppose your question could be answered in one way from that standpoint. I think this report further answers the question when it states that, when the commercial interests lying along this great stream would get the benefit of the low rate, the railroads would then institute a lower rate, and the merchants and those interested in freight transportation would patronize the railroad until the water competition was broken down and the rate was lost.

Col. BLACK. Under present rulings that can't be done.

Mr. JACOWAY. I understand it can't be done now.

Col. BLACK. No. Then, if that be the case and the river navigation is so much cheaper and has been so much cheaper, would it not be the natural thing that more boat lines would be established on the river now than ever before, because the river is as good as it ever has been?

Mr. JACOWAY. I would answer that question in the affirmative; yes, sir.

Col. BLACK. Another thing; do you know that the type of this dredge that is on the Arkansas River, and as good a dredge as there is in the United States, can only maintain about a mile and a half of channel a month?

Mr. JACOWAY. Yes, sir; I think your report shows about 2 miles a month.

Col. BLACK. That was before the experiment had actually been tried.

Mr. JACOWAY. Yes, sir.

Col. BLACK. That is based not only on the experience here in Arkansas, but also on the experience on the Mississippi and on the Ohio, the Ohio not being so conclusive. So you can see that in order to maintain a channel for the whole length by dredges alone—because those channels can only be maintained during one—

Mr. JACOWAY. I figured on it a little bit in Washington. I may be mistaken in the conclusions I reached, but from old steamboat pilots I understand that there are 17 bars between here and Ozark, and they are small bars, in most instances, which, if sucked out, would give river transportation between here and Ozark.

Col. BLACK. For nine months.

Mr. JACOWAY. For nine months in the year, and maintain a channel of $3\frac{1}{2}$ feet, and my estimate is that in 16 or 18 months, with the capacity of those dredge boats, that these little bars could be sucked out and this channel be maintained.

Col. BIDDLE. You don't think they would fill up again?

Mr. JACOWAY. As I state, I am not an engineer, but from those who are engineers, if we had the benefit of used rivers—stern-wheel boats or any type of boats that would keep the river washed—that would help to do it.

Col. BLACK. Maj. Dent has given me the facts showing that one dredge on the river dredged $1\frac{1}{2}$ miles a month. You must understand that they count the dredge—

Mr. JACOWAY. My estimate, I think, was working nine months of the year.

Col. BLACK. They can't work that long. You understand on these streams the movement of the bottom is so great that dredging is impossible or fruitless except at certain stages.

Mr. JACOWAY. Arguing from that standpoint, if two dredge boats couldn't do the work, it occurs to me that the Federal Government should give us four or six dredge boats to do the work, under the facts and figures which I think the tonnage on this river would show.

Mr. AUTEN. In order that the board may understand something of the order in which we are proceeding, I will say that this river is divided into six districts, the first river district being the Pine Bluff district, then the Little Rock district, then the Dardanelle, then the Fort Smith, then the Muskogee, and then the Tulsa district. I make this statement so that you will understand why we are calling these gentlemen in this order. I will now ask the gentleman, commencing at the upper end of the river, the Tulsa district, to come forward, Mr. C. L. Holland, of Tulsa, Okla., who will present the matter for that district.

Mr. C. L. HOLLAND. I represent the Chamber of Commerce of Tulsa, and I want to say to the gentlemen that I have prepared a statement which I desire to read to you, if you will permit me, and then will file it, and it will not be necessary to copy it. (Reads Exhibit F.)

My colleague will now give you his figures as to tonnage.

Col. BIDDLE. How far above Fort Gibson is Tulsa?

Mr. HOLLAND. It's about 60 miles.

Col. NEWCOMER. How far above Muskogee?

Mr. HOLLAND. About 50 or 55 miles.

Mr. AUTEN. The other gentleman from Tulsa is Mr. E. N. Adams.

Mr. E. N. ADAMS. I am traveling manager of the Tulsa Traffic Association, representing the chamber of commerce. (Reads Exhibit G.)

Col. BLACK. What railroads have you through Tulsa?

Mr. ADAMS. We have the Frisco, the Missouri, Kansas & Texas, the Santa Fe, and the Midland Valley. In handling crude oil out of the Cushing field, early last summer they were running five trains a day on the Missouri, Kansas & Texas, and I believe they ran about 60 cars to the train of crude oil alone.

Col. NEWCOMER. I presume you are aware that Tulsa is above what is ordinarily considered the head of steamboat navigation on the Arkansas River?

Mr. ADAMS. Not according to statistics, I shouldn't think.

Col. NEWCOMER. Why?

Mr. ADAMS. I believe Mr. Holland said the encyclopedia says the Arkansas River is a navigable stream to 650 miles above its mouth.

Col. NEWCOMER. I hardly think that the encyclopedia is as good an authority as the report of the Chief Engineer. There has been no steamboat navigation up there, has there?

Mr. ADAMS. Not that I am aware of, not in the present day.

Mr. HOLLAND. I would like to answer that question, if I may. Prior to 1870 there was quite considerable navigation carried on on the Arkansas River as far up as Wichita, Kans. That is the history of it.

Col. NEWCOMER. I understand the history of it is, so far as we have been able to get it here, that two boats made trips up there.

Mr. HOLLAND. Yes, sir.

Col. NEWCOMER. One of them went up, I think, to get a bonus of a certain amount of money to go up there, but it couldn't carry out the load; so it couldn't get the bonus. The other went up one season and went out the other season.

Mr. HOLLAND. We think it's feasible to make it navigable by locks and dams.

Col. NEWCOMER. Oh, yes; I'm not talking about what can be done.

Mr. ADAMS. We believe we can turn out the tonnage if we had the river to use.

Col. NEWCOMER. Yes, sir. I just wanted——

Mr. AUTEN. I find the time is moving rapidly, and the board is compelled to leave us this afternoon at 5 o'clock, and we have so many matters to take up that I am compelled to ask those who have statements prepared not to read those statements in full, but just to make comments on them and file them with the board for their consideration. Is that all right with the board?

Col. BLACK. We will consider the written statements afterwards.

Col. NEWCOMER. It seems to me that the statements should be read if they are not too long.

Col. BLACK. We want to afford the opportunity.

Mr. AUTEN. I will call on Mr. E. D. Bevitt, of Muskogee, who will present the matter for the Muskogee district.

Col. BIDDLE. How far is Muskogee above Fort Gibson?

Mr. E. D. BEVITT. About 4 miles above Fort Gibson, across the river.

Col. BIDDLE. On the south side?

Mr. BEVITT. Yes, sir. I desire to file Exhibits H, I, J, and K. I will just state briefly the points to which we wish to direct special attention, and that is that Muskogee is interested in Arkansas River navigation not only to secure rates that are lower in and of themselves, but also to procure rates that are fair relatively with rates in surrounding territory. I will elaborate on that a little further. And also we want to bring out that if the project of navigating the Arkansas is abandoned at this time it will retard the development of that section of the country; but, over and above all, if Arkansas River navigation is abandoned and Missouri River navigation goes through, or is continued, that policy will be absolutely ruinous to our section of the country, as I will bring out further; that the Arkansas bears to the north and at Muskogee it is close enough to the Missouri at Kansas City so that the two projects at that point become interrelated, and that Kansas City, having the benefit of the river rate and Muskogee not, or that section of the country not, our rates will have a tendency to rise with the killing of this navigation project; that that will simply be ruinous to our jobbers.

I will briefly tell why the rates to Oklahoma at the present time do not bear a fair relation to the rates in surrounding territory. Our section of the State was originally Indian Territory, and, therefore, not settled. The States to the north and south—Kansas and Texas—were settled at a time when Indian Territory was still a wilderness, as far as the white man was concerned. The railroads originally entered Indian Territory from the north and were gradually extended toward the south. As that was done the railroads added to the Kansas rates a certain amount for each extension. The added factors were so high when the railroads reached Texas that the rates in southern Oklahoma, or the then Indian Territory, were in excess of the rates to Texas. For instance, the rate to a point in southern Indian Territory from St. Louis was higher than the rate from St. Louis to a point in Texas just across the Red River, and they maintained those rates for 15 or 16 years, but in 1901 they adopted the Texas rate as the maximum, as they called it. In other words, the rates to points in

the State of Oklahoma would not exceed the rate to a point in north Texas, but the rates increased until the north Texas rate was reached. That was the history of the rates in Oklahoma until Muskogee began to develop as a city. At that time the roads all ran north and south. Along about 1905 the Rock Island was built east and west through Oklahoma, the Fort Smith & Western was built east and west, the Midland Valley was built from Fort Smith right through Muskogee. That enabled Fort Smith to cut in and to job in Muskogee's trade territory, and after taking the matter up with the carriers, and being unable to get any results, the merchants of Muskogee turned to the Arkansas River, on which they found reports of engineers saying it was navigable, although at that time navigation had entirely died out. You can see it was perfectly natural that they took the reports of the engineers for the fact that the stream was navigable and used that as a means of relief. They built a small boat, or procured a small boat, of about 50 tons, called the *Mary D*, in 1905. That boat made trips between Fort Smith and Muskogee, and the service was satisfactory. Then, to improve that service, they purchased a larger boat, a boat of about 300 tons, called the *City of Muskogee*, of which I have a photograph here. The boat was built at Evansville, Ind., and brought up to Muskogee loaded with three carloads of nails. This brought the railroads to terms, then, and they came to the Muskogee merchants and made reductions averaging about 19 cents per 100 pounds on most commodities. That placed Muskogee on a basis of approximately 7 cents above Fort Smith. That was a big reduction, and while it wasn't all they asked—they thought that the proper relationship would have been about 5 cents—but it was such a big reduction and such a big help, and the boat being owned by the city, or by the merchants and not a navigation company, and the merchants not caring to undertake the business or to give the matter the time and attention, the boat made no further trips.

Col. BIDDLE. How big a place is Muskogee?

Mr. BEVITT. Muskogee in 1910 had 28,000 people. We figure now—I think an estimate given out by the Census Bureau a short time ago gave them about 42,000 people. That is an estimate by the Census Bureau. I might add that a short time ago, owing to a case brought before the Interstate Commerce Commission by Oklahoma City, at which they complained that the rates to Muskogee unduly favored Muskogee as against Oklahoma City, the Interstate Commerce Commission found the discrimination to exist but left it to the carriers as to how to remove it. They gave the carriers the option of reducing the Oklahoma City rate or raising the rate to Muskogee. They adopted the latter course and raised the rate to Muskogee 6 cents per 100 pounds on iron and steel articles, and then raised the rate to Fort Smith 3 cents per 100 on iron and steel, thus reducing the differential from 10 to 7 cents. That is the present differential.

I have an exhibit here showing the effect of navigation on canned goods from New Orleans, effective June 1, 1908. The rate on canned goods from New Orleans to Muskogee was 51 cents. About that time the agitation in regard to the river navigation began, and on January 10, 1909, the rate was reduced to 40 cents, and a further reduction of 1 cent was made on February 1, 1910. Now, since river navigation has died out, the rate was increased from 39 cents to 44 cents, effective June —. The effective date is omitted from the exhibit, but it is of recent occurrence.

Col. ABBOT. That was by authority of the commission, I presume?

Mr. BEVITT. The rate was filed with the commission and permitted to stand.

Col. ABBOT. Under that other decision?

Mr. BEVITT. Yes, sir.

Col. NEWCOMER. Was that other decision that there was discrimination against Oklahoma City in favor of Muskogee on the same basis as the decision in the Shreveport case, that there was no substantial river competition?

Mr. BEVITT. No, sir. The commission held that though the river was navigable, a difference of 19 cents was too great, and they fixed it at 10 cents. The one allowed to stand was 10 cents.

Col. NEWCOMER. In other words, they recognized that you had water competition at Muskogee?

Mr. BEVITT. Well, the decision read that even though the Arkansas River were navigable, "we find 19 cents is too much." That was about the effect of it.

Now, we have statements here of the tonnage that, if the Arkansas River were navigable, you could route via the river. Taking the outbound tonnage, the first item is oil. There are two refineries at Muskogee, the Muskogee Refining Co. and the Cudahy Refining Co. The letter from the Muskogee Refining

Co. showed that, based on their last year's business, they could export 3,952 tons of refined oil, which would move down the river to New Orleans for export. They also stated that, when the war is over, they could export a great deal more, because they could not now ship any to Germany, which is one of their largest customers. I won't read the letter, in order to be brief.

The Cudahy Refining Co. from Muskogee exported 1,862 tons, but at their own solicitation they ask permission to file a letter as to their Coffeyville plant. Coffeyville is north of Muskogee. It has been stated that the commission compels a through rate, rail-and-water, should the river be navigable, and on that basis they wanted to show that they could export from their Coffeyville plant, sending by rail to Muskogee and then down the river, 3,100 tons, based on their last year's shipments.

Then on cotton. The cotton compress at Muskogee compressed 106,000 bales. The letter from the compress company says that it is safe to say that they will never press less than 75,000 bales at Muskogee. Seventy-five thousand bales would give a tonnage of 15,000 tons, which would be exported. That is, 75,000 bales would be exported from Muskogee.

The Muskogee Cotton Oil Mill deals in cottonseed products, and their export tonnage, as stated in their letter here, will be 5,000 tons, giving a total of 20,000 tons for export of cotton and cottonseed products.

The Arkansas Valley at Muskogee is a great potato country. We have a letter from a commission merchant who deals in potatoes. We consider him an authority in that country on potatoes. He says that if the river had been navigable this year, he would have shipped on it 150 cars of potatoes, saying the minimum weight on potatoes is 30,000 pounds. This would give over 2,000 tons of potatoes which he could have moved down the river.

The letters show that in grain and grain products they could have used the river to the extent of 4,490 tons.

We have a concern there known as the Eagle Cider & Vinegar Co., that handles cider, vinegar, apples, and fruits, and they think they could have used the river to the extent of 180 tons.

Col. TAYLOR. Do you know what proportion of the total shipments they figure would go by water?

Mr. BEVITT. No, sir; I don't. In some cases that is stated. In some cases the wholesale people at Muskogee state 50 or 60 per cent of their inbound tonnage could come in by river.

Col. TAYLOR. That is practically all that comes in that way, isn't it?

Mr. BEVITT. The majority of their groceries would come from Mississippi or Ohio River points or Atlantic seaboard points.

Col. TAYLOR. It wouldn't leave anything for the railroads to carry, then?

Mr. BEVITT. Just like we have four railroads there. The total tonnage is so much. Of course, they don't get it——

Col. TAYLOR. Oh, no one railroad gets it all.

Mr. BEVITT. No, sir. The tonnage I have got here, with the exception of the outbound tonnage, is from points that could move via the river. It shows the hypothetical tonnage——

Col. TAYLOR. You are figuring just the same way—that all of it could move by one railroad, aren't you?

Mr. BEVITT. Yes, sir; just exactly.

Col. TAYLOR. But, as a matter of fact, it doesn't all move by any one railroad?

Mr. BEVITT. No, sir.

Col. ABBOT. This statement is made up by letters you have received from these people?

Mr. BEVITT. Yes, sir.

Col. ABBOT. How carefully were the estimates made?

Mr. BEVITT. In a good many cases I was present when they made their calculations. In some cases I aided them. I am in a position to state positively that the figures are conservative. We are supposed to be a boosting country, and I was surprised by the conservatism shown by the merchants. I intended to caution them to be careful, but it wasn't necessary. They were conservative in making their figures.

This gives a total outbound tonnage, based on business actually handled in Muskogee last year, of 35,700 tons.

On the inbound this is in a separate list, and I have it classified under groceries, packing-house products, dry goods, clothing, boots, shoes, hardware, etc. It makes a total of 58,725 tons.

Col. ABBOT. That's what would be available for river commerce?

Mr. BEVITT. Yes, sir.

Col. ABBOT. But it wouldn't necessarily come that way; it would be divided between the river and the roads paralleling the river?

Mr. BEVITT. Yes, sir. But, in addition, the roads would have to themselves all the traffic that couldn't possibly come by the river, and, in addition to that, all this tonnage would move from river points where the rates would be affected by water competition; and, no doubt, if we have river navigation, the railroads would, to some extent, meet the rates the boats would maintain to those points, so it is fair to assume that there would be some reduction in rates on every pound of this merchandise. I will not take up your time to go into it further, but, as I say, it figures 58,000 tons and a little over.

I have some exhibits showing the resources of the country generally around through there—showing the increase of population of Muskogee. I will not take time to read these. You have stated that you will give the written statements consideration. It shows the grain and the coal and the products of the State generally which might move out via the river.

Now, as to the feature of discrimination and something we have hoped to obtain by getting the river improved: I have an exhibit (Exhibit H) which shows the class rates and some commodity rates from Memphis to Kansas City, to Joplin, to McAlester, to Vinita, and to Muskogee. Now, while Muskogee is much closer to Memphis than Kansas City, the first-class rate to Muskogee is \$1.15 from Memphis, and to Kansas City and Joplin it is 80 cents in each case; and the carriers, in testifying in commerce cases before the Interstate Commerce Commission, where this discrimination is involved, invariably testify that the rate to Kansas City is depressed by the water competition, and that goes with the commission. These rates have been justified. We have never been able to break them down, and it is self-evident that if we had river navigation at Muskogee that we would have benefited to that extent. We certainly would have the same rate that Kansas City has. This exhibit also shows the class rates—I just named the first-class rate—to McAlester, which is 60 miles south of Muskogee, and to Vinita, which is about the same distance north. In both cases the rates from Memphis to those two points are less than they are to Muskogee. One is south of us and one is north of us, and neither on the river, and it is fair to assume that if we had the river navigation our class rates from Memphis would be reduced to the points north and south of us. And I might add that in all cases involving commodity rates the advance of the carriers of their commodity rate is invariably a comparison with the class rate, so that the class rate is the basis on which their other rates are made and which are justified nowadays, at least before the commission.

Now, the second page of the exhibit shows the class rates from New Orleans to Kansas City, St. Joseph, Joplin, and Muskogee. Muskogee is south of Joplin and west. Joplin is intermediate with Kansas City; therefore the rate to Joplin from New Orleans is the same as the Kansas City rate, \$1.10, first class. The first-class rate to Muskogee is \$1.35, although on some lines, like the Missouri Kansas & Texas, where their Kansas City business would pass through Muskogee, Kansas City is 200 miles north of us.

Col. BIDDLE. What is the reason for that?

Mr. BEVITT. The carriers would say it's river competition up the Mississippi River and up the Missouri, and Joplin is intermediate between New Orleans and Kansas City on the short line. The short line gets the benefit of this. Muskogee is on a workable line between the two points, but not being the short line they don't get the benefit.

Col. NEWCOMER. Isn't the real reason because Kansas City is such a large tonnage-producing territory and they want to make rates to get that tonnage?

Mr. BEVITT. They make it in competition with the river.

Col. NEWCOMER. But there has been no competition down the Missouri River.

Mr. BEVITT. It has been this potential competition.

Col. NEWCOMER. Don't you think it is the tonnage?

Mr. BEVITT. Kansas City, being a much larger town than these other towns, is in a position to have navigation. As a matter of fact, as you doubtless know, they have a corporation there in which the stockholders are merchants, with a paid-in capital of over \$1,000,000—that is absolutely out of the question with us—and it is to hold down the power they have to produce navigation that those rates are put in.

Col. TAYLOR. Weren't those rates in effect long before that corporation came into existence?

Mr. BEVITT. The possibility of the corporation being formed was there. Personally, I think we are on the verge of an era of using the rivers. I think that railroading was so much faster than rivers in the early days that it became a sort of a fad to use the railroads and the rivers were neglected; but I, myself, think that the minds of merchants and jobbers generally are turning to water navigation.

Col. BIDDLE. How much water would you have to have at Muskogee?

Mr. BEVITT. Well, we relied upon the reports of the engineers of 2 feet 2 inches. We were up against it on the rate proposition and tried to find some way out. We found this report of the engineers saying that for certain periods of the year a channel of 2 feet 2 inches was possible, and we grabbed that.

I think that about concludes what I wanted to say, except that I want to reiterate that the improvement of the Missouri River and the abandoning of the Arkansas River would be ruinous to Muskogee. Kansas City now, on account of their cheap inbound rates, has a great many traveling men making Muskogee on lines of goods on which there is a larger margin of profit. On shelf hardware they travel men in Muskogee. They ship a great many groceries into Muskogee on the Missouri water proposition, and if they had an increase—if the Missouri River were made navigable—the tendency of their rates there would be down, while if the Arkansas were abandoned the tendency of our rates would be up, and we would have no recourse and couldn't stand very much difference now without very materially hurting our jobbers.

Col. BLACK. Did you understand the recommendation was to abandon the Arkansas? The recommendation wasn't that. It was that the work on the Arkansas should be continued. That consisted of two kinds—of snagging, which proved to be effective, and the dredging, which, owing to the amount that was done, proved to be utterly ineffective. The proposition was to stop the dredging and continue the snagging.

Mr. BEVITT. Our understanding was if the recommendation was carried out, the improvement wouldn't be made up to Muskogee and our river wouldn't be made navigable.

Col. BLACK. The snagging operations were to be continued.

Col. TAYLOR. Practically all the work that was being done on the river would be continued.

Col. BLACK. The recommendation was that the work should be continued—that is, the work of snagging—but that the dredging be discontinued.

Mr. BEVITT. Our fear was that the carriers would say, "You haven't even potential navigation," and that to get our rates we must have potential navigation and a good prospect of actual.

Mr. AUTEN. Before inviting the next district that is to be heard, I will say that the board will continue this hearing until 1 o'clock. We will then take a recess until 2 and return here and resume the hearing at 2 o'clock promptly.

We have heard from four of the six districts. We will now listen to Mr. George Sengal, of the Fort Smith district.

Mr. GEORGE SENDEL. Mr. Chairman and gentlemen. (Reads Exhibit L.)

Mr. AUTEN. This brings the matter down to the Little Rock district, and I am going to ask the gentlemen who are here representing the Aluminum Co. of America to come before your board and discuss that business to some extent. Mr. John H. Finney, manager, from Washington, D. C.

I will thank you if you will ask any questions. That is the quickest and easiest way to get any information.

Mr. JOHN H. FINNEY. We had a great deal of pleasure in welcoming this board to Bauxite yesterday, and the gentlemen from Little Rock who accompanied us, some of whom were down there, I think, for the first time because, I think, that we have at Bauxite a very tangible river navigation proposition.

Bauxite moves from this point in Arkansas to East St. Louis for our own purpose and to various other points north and east of East St. Louis for other manufacturers. Our movement last year amounted to 140,000 tons for our own use. We moved this year, to yesterday afternoon, a total of 168,000 tons for our own use to East St. Louis, and to all other places for that same period, to November 15, 198,000 tons. We have moved from Bauxite for our own use and for other people 1,144,011 tons since 1903. It is a daily movement. It

has been growing by leaps and bounds, and we are contemplating to-day a movement that will aggregate between 400,000 and 500,000 tons per annum.

The Aluminum Co. of America is the creator of the aluminum industry. When we first started our business under the Hall patents aluminum was selling at about \$5 a pound. When the capstone of the Washington Monument was put in place—it is aluminum—it cost \$15 a pound. To-day the prevailing price is somewhere around 20 cents. It has been done in your lifetime and mine—in the last 25 years.

The Hall process started in a small way in Pittsburgh in 1888; we moved to Niagara Falls in 1893 as the first user of Niagara Falls power. In 1896 we made 1,000,000 pounds. Last year we made 10,000,000 pounds.

It will probably be of interest to you to trace the movement of bauxite—our own movement of bauxite. Bauxite is the hydrated oxide of aluminum. It runs to 52 or 53 per cent alumina. We take the ore to East St. Louis, where we concentrate it by a wet process and get pure alumina or oxide. That is the only function of the East St. Louis works. That oxide is sent to various reduction plants—at Niagara Falls, three of them; to Messina, where we have a very large plant; to Maryville, Tenn.; reduction plants being also at those places because of the necessity for cheap electrical power in the electrolytic reduction of the alumina into aluminum. We are the largest users of water power in the world, with something over 300,000 horsepower at work in reducing alumina to aluminum. It is a very large and very important business, and the business is, as a matter of fact, really taxing the facilities of the railroads that come through this country to haul the ore to East St. Louis. A daily movement of from 30 to 35 carloads of ore, with two railroads to supply box cars—and it must be shipped in box cars—causes at various times a severe shortage of cars. We have frequently in the past years, even with a smaller movement of freight, found it absolutely impossible to get cars enough to haul the ore to East St. Louis, and that difficulty is bound to increase as time goes on. We realized that fact some two or three years ago and made ready for what we believed is the most tangible plan to use water navigation that exists to-day in the United States. We have spent a million and a half or two millions of dollars in East St. Louis in getting ready for this movement of freight by river. We have a magnificent outer belt that serves our belt from a terminal that is going to be second to none on the Mississippi River—a terminal located just opposite St. Louis with plenty of ground around it for transfer tracks, with interchange tracks, and arrangements with most of the railroads entering East St. Louis and a direct route to our own factory doors.

We have done more than get ready for it. We have actually engaged in the hauling of bauxite by water to East St. Louis, and we moved last year, as Mr. Fox will tell you, something like 15,000 tons from De Valls Bluff, down on White River.

It is a feasible proposition. We are not going into it with the idea of checking up a freight rate, although, of course, that is a contributing factor. As a matter of fact, the railroads originally charged us \$1.80, then increased to \$2.20. They now propose a rate of \$2.40, and it may not stop there. We can certainly haul it to East St. Louis for less than \$2.20, probably less than \$1.80. But that isn't really the important point. The important point is to provide facilities that we must absolutely have and which only river navigation will supply. I think that is about all that we need to say. We have got the ore. We have got a yearly movement that is tremendous in extent and that we must get to East St. Louis every day in the year, and we have made our plans to put that stuff up to East St. Louis by river.

Col. BLACK. Are you still shipping through the White?

Mr. FINNEY. Not at the present time, because those were not our barges, and those barges have been withdrawn from that particular service. I might say, however, that we have four modern steel barges that will be delivered to us some time in December, and we will put our own barges into the service just as soon as they are delivered to us.

Col. BLACK. Over the White?

Mr. FINNEY. Over the White, and over the Arkansas when the Arkansas can be used.

Col. BLACK. On what draft of water do you find you can ship economically?

Mr. FINNEY. I think we have been shipping on the White in those barges on a draft of about $3\frac{1}{2}$ or 4 feet. Our barges are 175 feet long, 1,000 tons capacity at 7 feet. They are not available for 1,000 tons at the lower drafts that we have in the lower Arkansas, but those barges are considered available when the

Arkansas can give us 7 feet; we can load them to 1,000 tons, and when the condition of more water in the White exists we can load them to 1,000 tons.

Col. TAYLOR. Are those self-propelled barges?

Mr. FINNEY. No, sir; they are towing barges. Self-propelled barges, we feel, are a mistake on a stream like the Mississippi, unless we can put so much power in them that they are not really self-propelled barges but towboats.

Col. BLACK. You find on a draft of $3\frac{1}{2}$ feet you can still ship by water on the White at a saving over the railroad?

Mr. FINNEY. Well, I think our experiment has proved it; yes. It wasn't an exhaustive experiment, because they were not ore barges; they were not well adapted to our use. They cost money to load and unload that we think we can cut in our own type of barges, which have been built for our own particular business. We believe that we can save over the \$2.20 rate over either the White or the Arkansas.

Col. TAYLOR. Where would you ship over the Arkansas? What point would be your terminal?

Mr. FINNEY. Well, there are two points available—Little Rock, with good railroad facilities, and Pine Bluff, with almost as good railroad facilities.

Col. BLACK. What would be your railroad haul to Pine Bluff?

Mr. FINNEY. I am not sure of that. Mr. Fox—

Mr. C. B. Fox. About 45 miles to Pine Bluff.

Mr. FINNEY. About 45 miles to Pine Bluff, as against 16 to Little Rock.

Col. BLACK. What is your haul now?

Mr. FINNEY. Sixty-nine miles.

Col. NEWCOMER. What is your nearest point on the Mississippi—rail point?

Mr. CARL BAER. Helena.

Col. NEWCOMER. Is that nearer than Arkansas City?

Mr. BAER. It's a better route.

Col. TAYLOR. Haven't you under consideration the possibility of a rail line to the Mississippi River?

Mr. FINNEY. To be built by the company?

Col. TAYLOR. Well, over which your bauxite will be hauled.

Mr. FINNEY. I don't know that that's a possibility.

Col. TAYLOR. Hasn't it been under consideration?

Mr. FINNEY. Oh, a great many plans have been under consideration. We are under the absolute necessity of seeing that bauxite gets to East St. Louis through some channel at all times.

Col. TAYLOR. Cheaper than at the present rate?

Mr. FINNEY. If it can be brought about.

Col. TAYLOR. At least not at an advance?

Mr. FINNEY. Not an advance to \$2.40. That \$2.40 rate may not stay in effect many years. It will gradually increase.

Col. TAYLOR. You haul over your own road a little distance of 3 or 4 miles, and then turn over to the Iron Mountain, or one of the other roads, do you not?

Mr. FINNEY. Yes, sir.

Col. TAYLOR. Don't you get a portion of that \$2.40 for the haul over your own road?

Mr. FINNEY. Yes, we get a division.

Col. TAYLOR. Quite a reasonable division?

Mr. FINNEY. Well, it's no more than the cost of doing the service.

Col. TAYLOR. What is it, may I ask, or don't you wish to give it?

Mr. FINNEY. Mr. Fox, what is that?

Mr. Fox. Twelve cents a ton.

Col. TAYLOR. That's what you get from the Iron Mountain, is it?

Mr. FINNEY. From the Iron Mountain, and I think 9 cents from the Rock Island. It isn't any more than the cost of doing the work.

Col. NEWCOMER. What is the rail haul to Helena?

Mr. BAER. I don't—

SOME ONE. From Bauxite to Helena, about 138 miles.

Col. TAYLOR. What was your rail rate to De Valls Bluff, or will Mr. Fox answer that?

Mr. FINNEY. Mr. Fox will answer that. I think the new rate that has gone in is 70 cents.

Col. NEWCOMER. Of course, you appreciate that on the Mississippi River there is now a channel available which would enable you to load your barges to 1,000 tons?

Mr. FINNEY. Yes, sir; the Mississippi River is all right.

Col. NEWCOMER. You couldn't load your barges to 1,000 tons on the White or Arkansas for a time to come?

Mr. FINNEY. For a number of months in the year, but not——

Col. FLAGLER. Have you explored the whole bauxite field there so that you know about what the complete bed is?

Mr. FINNEY. No; I should say that complete ore body has not been explored. It is very questionable if anybody knows how much bauxite is here.

Col. FLAGLER. Have you made estimates on it?

Mr. FINNEY. We have of our own holdings. We think we know how much we have.

Col. FLAGLER. Could you give an estimate in years, at your increasing rate of output, how long it would be before you would exhaust what you have there?

Mr. FINNEY. Well, that's just a problem in arithmetic. We have got nearly 5,000,000 tons, I should say, of available bauxite on our own property, and if we increase to 500,000 or 400,000 tons per annum we haven't got a great many years of ore on our own holdings; but this is the natural bauxite field. The geology of the region indicates that there is a great deal of bauxite in this particular section, and there is no question but that a great deal of it will be available—a very large tonnage will be available when there is sufficient demand for it.

Col. NEWCOMER. I would like to ask you a question about these terminal arrangements that you refer to at East St. Louis.

Mr. FINNEY. Yes.

Col. NEWCOMER. You mean a river terminal for the handling of bauxite?

Mr. FINNEY. I mean a modern river terminal, such as I don't know exists on the Mississippi River anywhere.

Col. NEWCOMER. To what extent has that work progressed?

Mr. FINNEY. Well, it hasn't progressed very far except that we have got the site, we have got the railroad to it, and we have got temporary loading and unloading facilities there.

Col. NEWCOMER. But it is your purpose——

Mr. FINNEY. It is our purpose to build a modern terminal that will handle not only the bauxite in but miscellaneous freight out.

Col. NEWCOMER. That is for general use?

Mr. FINNEY. That is for general use.

Col. NEWCOMER. In connection with what?

Mr. FINNEY. In connection with this Alton & Southern transportation line, or connecting line, that we have built in East St. Louis. It is a common carrier and is available for anybody's use, just as any other terminal facility—any other transportation company.

Col. ABBOT. It isn't exclusively for bauxite?

Mr. FINNEY. Not at all. Bauxite is going to give us quite a large and important tonnage, but it is only half of what we hope will be handled over that—only a small part of what we hope will be handled over it. Of course, our plans contemplate return cargoes for these barges—freight that is suitable to be handled in that way, and which will materially decrease the cost of handling the bauxite to East St. Louis.

Col. NEWCOMER. What is the title of that transportation company?

Mr. FINNEY. The barges, of course, are owned by the Aluminum Co. of America.

Col. NEWCOMER. You referred to some other——

Mr. FINNEY. Alton & Southern. It's a connecting railroad and terminal railroad there in East St. Louis.

Col. NEWCOMER. This navigation proposition wouldn't be operated by that company?

Mr. FINNEY. Well, not necessarily. I don't know that we have gotten to the point of organizing a transportation company per se. We are operating as the Aluminum Co. of America. The barges have been built by us, or for us, and there will be some operating agency. Whether it will be done by the Aluminum Co. or by a separate transportation company hasn't yet been determined. Primarily, it is for our own work.

Col. TAYLOR. Four barges wouldn't go very far toward handling your output.

Mr. FINNEY. That is true; but it is a mighty good beginning—four of the best barges on the river.

Col. TAYLOR. How long do you figure it will take to make a round trip with one of those barges?

Mr. FINNEY. Mr. Fox is more competent to answer that question than I am. He is in direct charge. I think about 14 days, however.

Col. TAYLOR. You spoke awhile ago about the difficulty of getting cars.

Mr. FINNEY. Yes.

Col. TAYLOR. Isn't that a traffic that is pretty profitable to the railroad—such a regular traffic as that—so easy to pick up, and so on? It would seem reasonable that they would make a special effort to give you cars.

Mr. FINNEY. Well, they do make a special effort to give us cars, but there are not a great deal of box cars in this particular section available at certain periods of the year. Large amounts of cotton take the cars down to the Gulf terminals and keep them there sometimes as storage warehouses for cotton. There have been several periods when we couldn't get cars, and those periods do occur generally every year, and they are going to occur with increasing frequency as we want more cars.

Col. TAYLOR. Wouldn't it pay you to supply your own cars?

Mr. FINNEY. That has been thought of. Private-car lines are pretty expensive propositions.

Col. TAYLOR. That is true; but you could get up a special car.

Mr. FINNEY. But that's the trouble. You can't get up a special car that won't one day find itself out in California with something else in it. We can't ship in tank cars. A car that will load bauxite will load grain or almost anything else, you know.

Col. TAYLOR. Can't you control those if you own them yourself?

Mr. FINNEY. No, sir.

Col. TAYLOR. You couldn't control the movements of them?

Mr. FINNEY. You couldn't control the movements of them. They will steal them away from you.

Senator JOE T. ROBINSON. You would have to have return tonnage in order to make the transportation profitable in any car?

Mr. FINNEY. Yes; you couldn't run the car loaded there and empty back here and—

Col. ABBOT. Wouldn't you have coal to bring back? Wouldn't you have a market for coal if you—

Mr. FINNEY. We would be getting into lines of business we don't want to go in. We can do it in a mild way with barges. We can bring cement or something of that kind without loading ourselves up with a lot of miscellaneous businesses.

Col. TAYLOR. Didn't I understand the gentleman to say this morning that the rate on first-class stuff from St. Louis to Pine Bluff is \$1?

Mr. BAER. Yes, sir; that's correct.

Mr. FINNEY. \$1 per 100. I am talking about tons.

Col. TAYLOR. That's right; \$20 a ton. So that you do get a low rate.

Mr. FINNEY. Oh, we have got a low rate. It's a cheap commodity and it moves in large quantities and it's a regular movement, and I imagine that the present rate is a profitable rate. They didn't lose money at \$1.80. I don't think, but there is a general tendency to advance the rate to a point that is rather large to us when you consider the tremendous volume that is contemplated. A 10-cent advance amounts to a lot of money when you are moving 500,000 tons.

Col. FLAGLER. Is your power in your reducing plant at St. Louis dependent on coal?

Mr. FINNEY. Our reducing plant at St. Louis uses only a modest amount of power—just mechanical power for driving machinery. The form of our operations in St. Louis involves the use of steam in cooking—for digesters and things of that sort. We are not users of power in East St. Louis. We are larger users of coal and limestone and soda ash, and things of that sort that go to make up the items in the process, but at the reduction plants the element of power is the large one. We must have cheap electric power in large blocks in order to make cheap aluminum. It takes 20-horsepower hours to make a pound of aluminum, so that the electrolytic method is slow. It involves large amounts of power, and, necessarily, cheap power, to make the cheap product.

Col. FLAGLER. Why shouldn't your East St. Louis plant, where you reduce to alumina, be located at Bauxite?

Mr. FINNEY. That question is very frequently asked. If we could move Niagara Falls down here we could do the whole operation at Bauxite. We haven't cheap fuel; we haven't cheap limestone and soda ash. East St. Louis was

selected as a cheap manufacturing and distributing point—a good deal better point than Little Rock—and the reduction works were necessarily located at these water-power sites. I think, when you figure the higher rate that alumina takes, the fact that we would ship half the amount that we are now shipping in the way of bauxite, it would seem that East St. Louis was a wise location for it. It would be nice if we had in this country what the French have, namely, bauxite, limestone, water power, and coal, all within a radius of 100 or 150 miles and fronting on deep water. A Frenchman said, in a statement to the Finance Committee of the Senate, that they could make, in France, aluminum 4 cents a pound cheaper than we can in the United States, and I don't doubt it; and I think it is largely because of their saving in the cost of getting the materials together from which the aluminum is made.

Col. NEWCOMER. You produce now about 50,000 tons per year?

Mr. FINNEY. About 50,000 tons per year.

Col. NEWCOMER. What is the world production, do you know—roughly?

Mr. FINNEY. Perhaps double that amount. All last year it has been very greatly disturbed by European conditions.

Col. NEWCOMER. You are the only producers in the Western Hemisphere?

Mr. FINNEY. Yes. Charles M. Hall, the inventor of the process here in the United States, invented the process at the time that Heroult invented his process almost identically. They were working at the same time on practically the same thing. Heroult got his French patents and we got the American patents, and the industry there has grown just about as rapidly as it has here. I mean, the total foreign production is about equal to the total American production.

Col. BIDDLE. Will you permit me just one or two questions?

Mr. FINNEY. Yes, sir.

Col. BIDDLE. What does the East St. Louis plant represent in dollars?

Mr. FINNEY. Ask Mr. Fox that question, please. Several millions.

Col. BIDDLE. What, if any, investigation did your company make at the time of locating your plant there as to the cost of coal at Little Rock and how it compared with the cost of coal at East St. Louis, if you are advised on that question?

Mr. FINNEY. Well, I haven't been with the company but 15 years, so that was done before I came with them. I do know, however, that with the thoroughness with which we generally do things that matter was very thoroughly investigated at that time. It isn't only a question of the cost of coal. It involves every other factor that goes to the cost of making alumina. It involves the cost of getting the alumina to the reduction plant.

Col. BIDDLE. But on the single item of coal, I was asking.

Mr. FINNEY. Well, coal isn't really such a large part, because we don't use a great deal of power at East St. Louis—nothing like the amount we do in the reduction work. I suppose 10,000 horsepower—

Col. BIDDLE. For cooking or steaming purposes?

Mr. FINNEY. For power and steam purposes, perhaps 10,000 horsepower.

Col. BIDDLE. Has your company recently been considering the question, in view of rising freight rates, of procuring bauxite otherwise or elsewhere than in Arkansas?

Mr. FINNEY. Yes.

Col. BIDDLE. Would you mind telling the board what you have done in that regard?

Mr. FINNEY. Well, I don't want to say anything more than that. I do know that we have secured, or are about to secure, other deposits of bauxite not in the United States as a matter of guarantee that we will continue in the aluminum business. I look forward to the time when every hog bank is a supply for the aluminum industry. That time hasn't come yet.

Col. BIDDLE. Why did you look elsewhere? I am trying to get back to the point as to whether or not freight rates and other conditions here were responsible for that action.

Mr. FINNEY. Well, freight rates had something to do with it, because we have bought, or where we are contemplating buying bauxite we can undoubtedly deliver bauxite up to the coast—coast points—cheaper than we can deliver—as cheaply as we can deliver it to East St. Louis.

Col. BIDDLE. Could you take the ore from the fields which you have procured in France and South America and deliver it to East St. Louis as economically as you can the Arkansas bauxite?

Mr. FINNEY. No; I didn't say that. I said to the coast. It would, of course, involve an alumina plant on the coast.

Col. BIDDLE. For reduction?

Mr. FINNEY. For reduction of that ore, of course, at the point of shipment. It might involve refining at the point of mining. It couldn't, of course, be brought into East St. Louis unless the Mississippi River were available some way.

Col. BIDDLE. Has your company, or have you, ever looked over the bauxite fields of Arkansas with the idea of making any approximate estimate as to how long the mines of Arkansas, or the bauxite deposits here, might last under the present rate of consumption?

Mr. FINNEY. I have not. There have been a good many guesses as to how much bauxite there is in Arkansas. Perhaps one man's guess is as good as another's. I have seen it estimated at 150,000,000. Hays's report estimated it at 50,000,000, and there are various other reports. I feel, myself, personally, that the man who says 150,000,000 is making as wild a guess as the man who says 50,000,000, because I don't believe either one of them knows, even approximately. Its a very faulty deposit.

Col. BIDDLE. Who made these estimates that you speak of?

Mr. FINNEY. The Geological Survey—they are available—and Hays's report, and others. I don't think any of them know with any certainty how much bauxite there is in Arkansas, but I would feel that the Arkansas district is the logical geologic district for the occurrence of bauxite.

Col. ABBOT. In the United States?

Mr. FINNEY. In the United States. There is some in Georgia, some in Alabama, and there is a little in Tennessee. There is a deposit of alunite out in Utah that has recently come into prominence as a source of potash supply. The Armours are refining it for the purpose of obtaining potash. Their by-product is alumina, so that this immense alunite deposit is an available source of supply. It isn't bauxite; it is alunite—a different thing.

Mr. AUTEN. What proportion of the American supply of bauxite comes from Arkansas?

Mr. FINNEY. Well, a very large proportion. The mines in Georgia and Alabama are not very large or important and are mostly used for the purpose of making alum. They are a little high in silica for our purpose. They are mainly used for alum supply.

Mr. AUTEN. Could you give us approximately, in percentage, what part is produced in Arkansas?

Mr. FINNEY. I should think considerably in excess of 90 per cent.

Mr. AUTEN. That's all, unless the board has some questions.

Mr. FINNEY. I will be very glad to answer any questions I can intelligently.

Mr. AUTEN. If that's all, we will ask Mr. Fox to come forward. Mr. Fox is the manager of the reduction plant in East St. Louis, Mo., which handles the bauxite mined here.

Mr. C. B. Fox. I have before me a large book containing figures showing the tonnage moving in the last 10 or 12 years, since we acquired those properties down at Bauxite. Mr. Finney has told you a good deal about the aluminum industry and the Aluminum Co., which I suppose you are interested in in a general way, and which, really, it seems to me, has hardly any bearing at all on this question of river navigation, which, as I understand it, is the subject that you have to consider.

I happen to be closely connected with this movement of river navigation for two reasons, one of them being that I have charge of the East St. Louis plant, which is, probably, the largest single plant the company has, and it is located fairly close to the mines and dependent very largely on the mines, so that the two have to cooperate very closely. Another reason, probably, is that I am still a young man and the company had no one else to throw all this work upon, so they put me at this job of river navigation.

When we first started to operate in Bauxite, we undoubtedly had the same idea that anyone else would have who was preparing to move low-grade freight—that is, if there was a navigable river anywhere accessible, we would consider the possibilities of utilizing that navigable river. There isn't any place in the world, I believe, where they move ores or low-grade tonnage, but what they move it by water when it's possible to do so, and there never has been a time when it was more desirable to do so than now when the railroads have made a very good case, I believe, on the basis that it costs them more to operate than ever before, that it costs them more for material, that they pay more for labor, that their taxes are higher, and that there is every reason why their rates should be higher than they have been in the past.

Now, if a low-grade commodity like ours has been moved in the past by the railroads at what they considered was not a very remunerative rate, naturally they would feel that under their increased expenses it would be still less remunerative, and that would divert our attention still more strongly to river transportation. In addition to that the tonnage has grown. When we started moving this material it wouldn't justify an investment in terminals, it wouldn't justify an investment in any considerable barge line or towboats to handle the material, but it has now grown to a tonnage on which such an investment is justified, and the course of freight rates has gone just exactly as one would have looked forward to when we first went into this proposition. When we shipped our first bauxite from these mines down here after we acquired them in about 1903—when we built the East St. Louis works—we shipped 9,827 tons; in 1904 we shipped 18,656 tons; in 1905 we shipped 26,836 tons; in 1906 we shipped 42,276 tons; in 1907 we shipped 52,584 tons; in 1908, following the panic, we didn't run more than half time—we started, I think, about May, 1908, after the panic of 1907—the tonnage fell to 28,997; in 1909 it went up again to 98,608 tons; in 1910 it was 107,176 tons; in 1911 it was 119,203 tons; in 1912 it was 108,984 tons. In the year 1912 we were partly closed down because of a car shortage the last three months of the year, when we couldn't get our full shipments. That's the reason why the 1912 tonnage fell below the tonnage of 1911. In 1913 we shipped 157,571 tons; in 1914 174,577 tons, and, up to yesterday, we had shipped 201,000 and some odd tons. The total shipments this year will probably run 225,000 tons.

Now, I say the tonnage has grown until we feel justified in investing in terminals, and if necessary, providing such river equipment as would handle this output. Another reason, and probably the more pressing reason, was that when we started to move this material from Bauxite the rate was \$1.80 per ton. At that time we were shipping perhaps a car a day or two cars a day. When it grew to five or six cars the rate was raised from \$1.80 a ton to \$2.20 a ton, and two or three months ago the railroads filed an application with the Interstate Commerce Commission for an increase in this rate from \$2.20 a ton to \$2.40 a ton. A hearing was had on this increase in rate at Chicago about a month ago, and it wouldn't surprise me at all if the commission gave the increased rate of \$2.40.

Now, we are differently situated in this country from the aluminum companies in foreign countries—the French and the British and the German aluminum companies. We take our bauxite and move it 450 miles or 440 miles to East St. Louis and pay freight on it. We take 2½ tons of bauxite to make 1 ton of concentrates, and we take 1 ton of concentrates and ship it 600 miles to Niagara Falls to make 1 ton of alumina—

Mr. FINNEY. One-half ton of alumina.

Mr. Fox. Yes; one-half ton of alumina—it's cut in two—and we ship it 1,200 miles to Messina to do the same thing, where we get our water power. In other words, we ship 5 pounds of ore away from this place down here at Bauxite in order to get 1 pound of the metal, and after we have made the metal at the place where we have hydroelectric power, we then have to ship it another 1,000 miles, where it is used, in the New England States, to the steel mills, and other places where it is used. In France and Great Britain and in Germany the bauxite mines are right close to the reduction plants, and the reduction plants are right close to water power, and the whole machinery for the production of the metal from the ore isn't only concentrated at one point, but it is close to tidewater, so they can land metal here on the east coast of the United States, as they did before the war, at prices lower than we can afford to sell it for to-day. When the war broke out, as Mr. Finney will corroborate—I don't know—there was some 6,000,000 or 8,000,000 or 10,000,000 pounds of aluminum in warehouses right down in New York and Philadelphia and Atlantic coast points—

Mr. FINNEY. That's true.

Mr. Fox. Placed there and on sale at lower prices than we could afford to sell it for. There's a reason for that.

Col. BLACK. What is the tariff on it?

Mr. Fox. The tariff, I think, now, is 2 cents a pound. Now, there's a very very plain reason for that. If you have to take 5 tons of raw material and carry it 450 miles to where you take the impurities out of it, and then take it another 600 miles to where you can get water power and separate the oxygen from the metal, and then take it another 1,000 miles to where you market it, your expense for transportation is so high that you can't compete with another

concern which pays nothing for transportation, except on the finished metal, and their transportation on that is the lowest transportation in the world—water transportation. Under present prices for metal, such reasoning doesn't hold good, but we all hope and expect that this war isn't going to last forever. The argument I am making is based entirely on regular peace times, and in peace times, with the growth of this industry, the price of aluminum has come down from \$16 a pound, which Mr. Finney spoke about, until before the war broke out he was selling aluminum for 17½ and 18 cents a pound.

Now, as we told these tax-commission people last summer—as the president of our company, here, told this tax commission here last summer—we would much rather do business on 17½ or 18 and 19 cent aluminum and sell 100,000,000 pounds of it than to sell 1,000,000 pounds for 50 cents a pound. We have got a natural pride, like every American has, in trying to build up an industry. We would like to have a big industry rather than a small one, and we would like to also have the slightly patriotic motive of getting this necessary and what is now comparatively common metal in the hands of everybody, in place of in the hands of a few people who can afford 50 or 60 cents a pound aluminum. When I was a clerk in a hardware store we used to sell a little 10-quart copper-plated kettle for \$2.50, and when I came to the Aluminum Co. that same sized kettle was selling in aluminum for something between \$4 and \$5. You can buy the same kettle I have sold over the counter for \$2.50 in copper in aluminum and it will last a lifetime. You take a young couple and present them with a set of aluminum cooking utensils and the cooking utensils will last longer than they will, if properly taken care of.

Col. BLACK. You mean if the cooking utensils are properly taken care of?

Mr. Fox. Yes. I will go back to what I started to say. The conditions that confronted us a year and a half ago impressed on us very forcibly that we couldn't afford to continue to pay high freight rates and freight on every move we make and compete with those foreign companies who have bauxite at tidewater and who have water power within a few miles of tidewater and who have cheaper labor than we have and who have got merchant marine and can transport their stuff anywhere in the world. Being confronted with that situation, the low price of the metal and the increasing freight rates on our bauxite, we became much more interested in this water transportation, and our president said to me, "Now, this question has advanced beyond the stage of a mere object of discussion. It has advanced to a stage where we have got to do something. We have seen our bauxite freight rate on our one car a day basis of \$1.80 raised to \$2.20 when it comes to 6 or 7 cars a day, and now raised to \$2.20 when it comes to 10 cars a day. If we ship 20 cars a day we will be paying \$3.50 a ton." So he said to me, "Now, I want you to go down and look into this river situation, and I am going to California, and if I come back from California and there has been no bauxite moved on the river to East St. Louis I will refuse to be neutral on the question any longer." So I got busy and came down here. I didn't know anything about river transportation. I looked over the Arkansas River. I looked over the White River. I went in to see Mr. Van Frank, in the United States engineers' office, and I asked him whether there was anything moving on any of these rivers. He said "The Government moves barges up the White River all the year around," or something like that; and I went over to the White River and I saw tows coming down there—these 500-ton barges with a big tug coming down and swinging around those bends. I looked to see if there was a place where we could unload anything. I found an old dock there that had been used by the Ayers-Lord Tie Co. to handle ties in and out. I went to Chicago and saw Mr. Lord and I leased that dock. I then went to the Atlas Transportation Co., who had some barges and who were moving cement down the river, and asked them if they would send some barges up the White River. I asked them to investigate the White River and see if they could send some barges up there and move some of this stuff. They said they would move it for \$1.50 a ton. I looked at the Arkansas distance tariff and saw that the rate to Devall Bluff, the nearest point on the White River, should be 50 cents a ton. That made \$2. I figured we could handle it at Devall Bluff probably for 10 or 12 cents a ton, and with the terminal we would build at East St. Louis I figured we could handle it there for 5 or 6 cents a ton, so we could equal the \$2.20 rate, and we did move it.

We moved some 12,000 or 14,000 tons, and there wasn't anything about the whole proposition from beginning to end but what was perfectly feasible. I don't know of a single place where we fell down on the whole proposition.

except the barges were wooden barges and had been used for handling logs or other things—the general type of wooden barge. The first barges we put in were regular coal barges, sunken barges. We loaded those barges and we found the water seeped in. They were old coal barges and the water seeped in, and the bauxite, which we had dried at Bauxite at considerable expense, when it arrived at East St. Louis was wetter than it was when it left the mines at Bauxite; and the first barge struck a heavy rain and absorbed some 25 or 30 per cent of water and came very near sinking. So that was a lesson to us not to use any more of those shell barges which sank down in the water. The next barges were decked barges, and the decked barges, while they moved the cargo dry, were really not very much better than the others, because the first barge we loaded they said “Be careful in loading it,” and we loaded a carload right in the middle of it and the seams sprung on it and we had to put a gang of men to work there pumping the water out of it. Of course, spreading the stuff all around and closing the seams added very materially to the cost. In the unloading we had a steam crane that ran down and grabbed hold. There isn’t anything cheaper unless you use big clamshells, but these clamshells would grab this ore spread out and they wouldn’t get a real good bite before they would be down to the deck. If the ore had been piled in a ridge right down the center in a deep pile, the clamshells could have been worked and taken good, solid bites, and the cost of unloading would have been very much less. After unloading 4,000 or 5,000 tons—on one barge we loaded 758 tons, which was the largest barge we moved—after loading a few barges we decided that steel barges would be best, where you can run this stuff on it at your loading dock in two or three hours and can unload it easier in East St. Louis—the expense would probably be less. We tried to get some steel barges, but couldn’t get them. We studied the question. The material had to be kept dry. If in a heavy rain it would absorb 25 or 30 per cent of water, you couldn’t afford to load your barges up to full capacity or you would sink them. We finally decided on the tarpaulin scheme, and we ordered from the American Bridge Co. four steel barges so designed that the cargo can be put on them and a tarpaulin put on them and the load kept dry, and as they come into port the deck hands can remove the tarpaulins and everything be ready so that they can be unloaded with the clamshells.

We have gone into this river business to stay. We will either navigate the Arkansas or we will navigate the White, and we will navigate the Mississippi. Like this question of the amount of tonnage down here in Bauxite, I am convinced—I don’t run the Aluminum Co., but I am convinced—that either I or my successors will move this tonnage on the river. With the increased expense of railroad transportation and the low price which will prevail after this war for aluminum, the only feasible way for the Aluminum Co. to stay in the business is to move this stuff by water, and when it’s moved by water in the tonnages which we are moving now I am convinced that it can be moved from some river point down here for \$1 a ton. There isn’t any reason why these 1,000-ton barges can’t be towed up that Mississippi River with one tug at all seasons of the year. There is plenty of water in the Mississippi at all seasons of the year from St. Louis to the mouth of the Arkansas. I am also convinced from the records I saw in the engineer’s office here of the White River that the White River can be navigated 12 months in the year with practically 6 feet of water. I just want to make sure that I am right about that. [Refers to papers.] It was because of an examination of these records that we really decided to do something on the White River. In the White River at Clarendon, which is a few miles below De Valls Bluff, the Government record shows, in 1905, during the whole of the last 10 months of the year there was over 6 feet of water, and in January there was 6 feet—during 11 months, I should have said, in place of 10. In 1906 there was over 6 feet of water every day in the year. In 1907 there was over 6 feet of water every day in the year. In other words, there were only seven days in the eight years ending in 1912 when the gauge showed a reading below 6 feet.

Now, that was the basis on which we undertook to do something on the White River, and I am telling this because when we had a railroad hearing here somebody said, “Well, if we put in such-and-such rates what guaranty have we that the Aluminum Co. will move the stuff?” and I have heard it asked here a great many times this morning, “If navigation is put in effect you will put a boat on here, and the next thing the railroad will put the rate down and the boat will be taken off, and away will go the river business.” I have endeavored to show that no matter what the railroad rates are, the rail-

roads can't afford on this low-grade material to put the rate down to where the stuff will have to move by rail, and we are going to stay in the aluminum business and get our supply from the State of Arkansas.

After we had begun to move this stuff on the White River we had moved about 8,000 or 10,000 tons when a new railroad tariff was issued in the State of Arkansas raising the rate to De Valls Bluff from 50 cents a ton to 70 cents a ton, and that almost put a quietus on us, because if we had been in the business simply to get the railroads to put the rate down the 20 cents difference which that made would have been altogether sufficient to drive the river transportation company out of business. We were just about breaking even——

Col. NEWCOMER. I will ask you what was your share of that rate—your initial line's share?

Mr. Fox. On which rate?

Col. NEWCOMER. Of that rate to De Valls Bluff. I understood you got 40 cents out of that.

Mr. Fox. No; not out of the 70 cents. Under the State tariff here there is an arbitrary charge in case there is a two-line haul. The first line is given 40 cents a ton, and that's an arbitrary above the single-line haul. Whether they haul it 5 feet or 5 miles they get 40 cents. In other words, if there was a single line from our mines to De Valls Bluff the rate would be 70 cents, and if there was another line there and they hauled it only 5 feet or 5 miles they would get 40 cents in addition. As I am told, the State railroad commission here——

Col. NEWCOMER. I understand you to say the second line would get 40 cents in addition?

Mr. Fox. No; that first line that handles it.

Col. NEWCOMER. That's your line?

Mr. Fox. That's the Bauxite & Northern under the State tariff, but that don't come out of the tariff. When I spoke of 70 cents the trunk line was getting 70 cents.

Col. NEWCOMER. I thought that was both lines.

Mr. Fox. No, sir.

Col. ABBOT. So that 40 cents was simply an entry on your books?

Mr. Fox. Yes, sir. As I told the State railroad commission, if we do the switching we ought to get a revenue on the switching. If the Iron Mountain had built in there and had undertaken to take the cars in there and spot them and take them out, we wouldn't have built the Bauxite & Northern.

Col. BLACK. Somebody this morning said you got 10 cents out of the Iron Mountain out of the \$2.20 rate.

Mr. Fox. Yes; and we perform the service for that. If the Iron Mountain would perform the service and pay for that line there we wouldn't do it.

Mr. BAER. What have you invested in that short line, approximately?

Mr. Fox. I think something like \$150,000 or \$160,000.

Mr. BAER. The 10 cents, then, covers the investment and the cost of carriage and operating the line?

Mr. Fox. The 10 cents is in payment for that service, taking the cars from the junction, taking them to the mines, spotting them, going in and getting the loads, and delivering them to the junction, and it's worth the money—just about what it's worth.

Col. NEWCOMER. I understand there's a distance tariff in effect in Arkansas.

Mr. Fox. Yes, sir.

Col. NEWCOMER. And that distance can be taken from Bauxite and not from the junction point to Devall Bluff.

Mr. Fox. Let me explain. As you cross that railroad you will see a place called Bauxite Station. Bauxite Station is a place on the Rock Island Railroad. What we call Bauxite is the mine. We take those cars out of there to the mines—just the same spotting charge that the Interstate Commerce Commission recognizes—a switching charge—terminal charge. We perform the service. The Bauxite & Northern goes in and places those empties at the mines, spots them at different places, takes the loads out and delivers them to the railroad at Bauxite Station. For that service it gets out of the through rate 8 cents a ton. The Iron Mountain, some few miles away, is a much longer haul, and for that same service for the Iron Mountain—you understand, we are performing that service for the Iron Mountain—it's the railroad's duty to go in there the same as they do at East St. Louis or any other place; it's their duty to go in and spot the cars and take them out. They don't do that here;

the Bauxite & Northern does that. For that service for the Rock Island they get 8 cents; for a similar service for the Iron Mountain they get 12 cents.

Col. NEWCOMER. In the matter of the intrastate movement, your line is rated as a carrier?

Mr. Fox. Yes, sir.

Col. NEWCOMER. And the point of origin can be taken at the mines?

Mr. Fox. Yes, sir.

Col. NEWCOMER. And the distance tariff can be applied from the mine to Devall Bluff?

Mr. Fox. Yes, sir.

Col. NEWCOMER. And that distance tariff would be about 70 cents, wouldn't it?

Mr. Fox. No; if it was a single line it would be 70 cents, but because there are two lines the Bauxite & Northern handles it first, then the Rock Island, which is \$1.10.

Col. NEWCOMER. You mean to say that the existence of a tariff that determines the rate ordinarily has added to it in the case of a double-line haul?

Mr. Fox. Yes, sir; the arbitrary of 40 cents is altogether too much, as we told the railroad commission here. For our service we are willing to put in a fair rate, 10 cents or 12 cents a ton to the Iron Mountain.

Col. TAYLOR. You get that 40 cents back, so it gives you a net rate of 70.

Mr. Fox. They might as well say \$40, then the rate to Devall Bluff would have been \$40.70. It has no relation to the——

Col. BIDDLE. It costs you about 10 cents to get it from the mine——

Mr. Fox. The switching service is worth about 10 cents.

Mr. BAER. The Aluminum Co., operating their own road, do not in any way participate in the 70-cent present rate——

Mr. Fox. No; you haven't got it right. The Aluminum Co. isn't operating its own road. The Bauxite & Northern is a railroad organized under the laws of the State of Arkansas. It has to ship for the American Bauxite Co. and the Aluminum Co. just the same as it does for every other man that offers freight. They have to do that.

Col. NEWCOMER. That railroad doesn't participate in the 70-cent rate?

Mr. Fox. It does not; no.

Col. NEWCOMER. What is the rate to Helena, do you know, from Bauxite?

Mr. Fox. Under the State tariff the rate to Helena, which is 140 miles. I should say would be about \$1.10. They have certain arbitrary divisions where they divide 35 and 45 and 45 and 55. I did know what it was. They rearranged those divisions after we moved this stuff on White River so as to throw Devall Bluff right in the most expensive division. That was the first thing that occurred.

I have pretty nearly covered all the ground that I intended to cover, except this: We come now to the Arkansas River. People have said, "If you were operating on White River you are not going to leave White River and come up on the Arkansas, even if they do make it navigable." The Arkansas River, of course, is 40 miles closer to our mines—Little Rock is—than Devall Bluff, and if we had a third river that ran right to the mines naturally we would put it right on the boats there. The State railroad rate from Bauxite to Little Rock is now 40 cents, to Devall Bluff 70 cents. That's a difference of 30 cents a ton. And the distance to Little Rock from St. Louis is practically the same as the distance from Devall Bluff to St. Louis, so if there were water in the Arkansas and navigation on the Arkansas River, it would be to our interest; we wouldn't have to be put under bond to use the Arkansas; we would use it.

Col. BLACK. What would be the minimum depth you could use on the Arkansas?

Mr. Fox. Those barges are supposed to carry 1,000 tons on 7 feet. We would like to see 7 feet.

Col. BLACK. What would be the minimum depth?

Mr. Fox. That's a difficult question to answer.

Col. BLACK. That is the one we have to know.

Mr. Fox. It involves this: Which is it cheaper to do, to carry this stuff by rail to the White River, where you can get, perhaps, 7 or 8 feet 8 or 9 months in the year—this year, you could get more than that, probably—which is it cheaper to do, take it to the White River and operate your barges to full capacity seven or eight months in the year, or bring it to Little Rock with probably a maximum of 5 feet? I should think if you couldn't get 5 feet, there wouldn't be much use of bringing the barges up, not for our kind of stuff.

Col. TAYLOR. You spoke awhile ago of being able to carry it for \$1 a ton to St. Louis by water.

Mr. Fox. Yes.

Col. TAYLOR. Do you mean from your mine?

Mr. Fox. No; from the nearest navigable point.

Col. TAYLOR. How far is it from Devall Bluff to St. Louis by water?

Mr. Fox. It's 580 miles to the mouth of the Arkansas from St. Louis and 130-odd miles to Devall Bluff—about 725 miles.

Col. TAYLOR. A little over 700 miles.

Mr. Fox. A little over 700 miles; yes.

Col. TAYLOR. One dollar a ton would be about a mill and one-half per ton-mile.

Mr. Fox. Yes; I suppose so.

Col. TAYLOR. That's pretty cheap, isn't it?

Mr. Fox. Well, it's nothing like what they are carrying iron ore for on the Great Lakes.

Col. TAYLOR. But do you know of any place on any river where they carry it for a mill and a half?

Mr. Fox. The Detroit River. Of course that's part of the Great Lakes.

Col. TAYLOR. Where they are carrying it on 10,000-ton ships; of course, that's a rate which can't be equaled on any river in the world.

Mr. Fox. I don't know very much about any other rivers. I have told you just how I got into this transportation business; but, Mr. Engineer, I don't see, if there is water on the Mississippi, why you shouldn't carry it for practically the same rate. I saw lots of boats of 6,000 tons. I used to operate a dock on the Great Lakes. We had lots of boats carrying 3,000 tons.

Col. TAYLOR. They didn't carry it as cheaply as they do now.

Mr. Fox. They carried it from Duluth to lower lake ports for 60 or 65 cents a ton, and they are carrying it now for as low as 35 and 40.

Col. TAYLOR. There you have very unusual conditions. You have a long haul, remarkably cheap loading and unloading, and they are comparatively cheap boats carrying large loads and going all the time.

Mr. Fox. Why should the loading be any cheaper there than we can make it at Devall Bluff and East St. Louis—loading and unloading? I operated at Port Huron with the same kind of machinery that we have at East St. Louis. They can't load at upper lake ports any cheaper than we can here if we are on the river and chute it into a barge. There isn't a particle of difference. You have got the same kind of water in the Mississippi you have got up there, only it's dirtier.

Col. TAYLOR. It's running faster.

Mr. Fox. Yes; but you get the advantage of it.

Col. TAYLOR. But you are going up loaded.

Mr. Fox. Yes, sir; but you get more wind and wave up there than down here; and I have seen a great many of them held up for days by wind and wave.

Col. BLACK. And you think barges with towboats would compare, in cost of operation, with light steamers?

Mr. Fox. I think so. Say we pay \$15,000 apiece for these barges—\$60,000. You get a towboat capable of handling 6,000 tons up the river and you will probably pay \$250,000 for it. That's just a rough guess of mine. Six barges—you would have, say, \$350,000. Those boats they used to handle iron ore were laid up three months in the year, and they frequently would go up light at a greater expense, probably, than they would loaded.

Col. NEWCOMER. The estimate of yours of \$1 a ton, as I understand it, is simply for the moving in barges from one terminal to the other; it doesn't include the terminal charges? In other words, it is comparativel to the present rate you have?

Mr. Fox. You can load that stuff, if you have got the right facilities—you ought to load it for a cent and a half a ton—material like ours. You ought to be able to put a bin up there and belt conveyer under it and run that belt out and discharge on the boat.

Col. NEWCOMER. That's without any overhead charges?

Mr. Fox. Yes, sir; that's without any overhead charges; but when you get into the game you have got to forget about your overhead. If we invest \$1,500,000 or \$2,000,000 in barges and terminals we have got to forget about the overhead; we have got to run that——

Col. NEWCOMER. That's a part of your cost?

Mr. Fox. That's a part of our cost; yes.

Col. NEWCOMER. I wish to ask whether you have any propositions from towboat people which will justify an estimate of \$1 a ton, or whether that is your own estimate.

Mr. Fox. We have an estimate of \$1 a ton from East Memphis. Any time we want to move our stuff, we can get plenty of towboat men to move it from East Memphis or New Hopeville. I have examined the equipment that those men have got, and I think we can get equipment which will absorb the difference. That's my basis for thinking we can move it for \$1 a ton. Is that a good reason?

Col. NEWCOMER. How far is it from St. Louis to Memphis?

Mr. Fox. Four hundred and fifty miles.

Col. NEWCOMER. How far from Memphis to the mouth of the White?

Mr. Fox. About 180 miles. But they will make the same rate practically to the mouth of the Arkansas that they will to Memphis.

Col. NEWCOMER. That's a very different proposition.

Mr. Fox. Yes; or to Helena. They don't care so much where it is, just so long as it's on the Mississippi. They dislike going off the Mississippi.

As I understand this question, this report has been made that further appropriations be discontinued on these rivers because of the fact that there was no tonnage; that the tonnage was decreasing; and that there was no prospective tonnage. All that we want to appear before this board and say is that we do have the tonnage. We have got a tonnage that is constantly increasing and that will continue to increase, and we will use the river if you will give us a river, and, as evidence of that, we have used the only stream that anybody can negotiate with these boats, and that is the White. We have bought these 4 barges and will buy probably 25 more, and we will possibly buy more; and, as I told Mr. Barrett of the towing company, "We would like to have your company do our towing, if you can do it. If not, we will do it ourselves."

I am probably more familiar with this bauxite tonnage than Mr. Finney is. There have been all kinds of estimates made—from 4,700,000 to 500,000,000. My opinion is there will be bauxite here for my children and my grandchildren. Ever since I have been with the bauxite company I have heard—and I probably joined in with them four or five years ago—"We had better look out for our bauxite and take care of it, because our production is going to exhaust it"; but every so often when the man in charge of the mines comes along and says they are about gone, some fellow comes along and is mining bauxite; and we go down there and buy that man's property, and we have probably 1,000,000 or 2,000,000 tons there. That has been the history of this field ever since we went into it. Last summer a man came into Pittsburgh—he's connected with this natural-gas pipe line—and came in to see us and said he would guarantee that he had 15,000,000 tons of bauxite on his property. I haven't any doubt he has it. He's one of these lucky fellows. Whenever he goes into oil or gas or anything he hits it. He will be probably selling us bauxite. That's one instance. I think here in the State of Arkansas there is plenty to keep us going 50 or 60 or 70 years.

Col. NEWCOMER. Without knowing where it is going to be discovered, can you say whether it's in reach of the Arkansas or White Rivers?

Mr. Fox. If you study these bauxite deposits in this country, you will reach the decision that this district is of such a geological nature that it will be found in this section. Nature has acted on syenite in this district so as to produce bauxite, and she hasn't acted on it in that way in others.

Col. NEWCOMER. I would like to get into the record a statement of the approximate extent of the bauxite field as at present known. The statement was made to me yesterday that it isn't very wide—if that's true—possibly a few hundred yards wide and a couple of miles in length.

Mr. Fox. My idea is that there are two or three counties in which there will probably be plenty of bauxite found for a good many generations.

Mr. AUTEN. About what is the cost of the terminals—I don't mean cost—about how much have you expended on the St. Louis river terminals and the railroad running to it, up to this time?

Mr. Fox. We have spent somewhere between \$1,500,000 and \$2,000,000.

Col. TAYLOR. That is your St. Louis reduction plant?

Mr. Fox. Oh, no; that's the belt line and terminal.

Col. TAYLOR. That's the St. Louis terminal?

Mr. Fox. East St. Louis terminal.

Col. ABBOTT. Alton & East St. Louis Railroad?

Mr. Fox. Alton & Southern Railroad is the corporate name under which that \$1,500,000 or \$2,000,000 has been spent.

Col. ABBOT. That is for the whole terminal development?

Mr. Fox. Yes. The Kansas City & Missouri River Navigation Co., that some one spoke of here—the Pine Bluff man spoke of getting these rates through to the East—are now negotiating with us for the use of our dock there so that they can bring their material in, and, with the railroad connections we can give them, transport their material through on these eastern lines.

Col. TAYLOR. They have a terminal of their own in East St. Louis, have they not?

Mr. Fox. They have a lease and it expires this year or next. The Terminal Association owns that river front for 21 miles, practically from Alton to where we bought, in East St. Louis. We couldn't get anything from the Merchants Bridge to where we are.

Mr. AUTEN. How far from the river is your reduction plant?

Mr. Fox. About 3 or 4 miles.

Mr. AUTEN. What is the expense of a reduction plant—the amount of the investment?

Mr. Fox. I suppose we have got somewhere between \$5,000,000 and \$6,000,000 invested.

Mr. AUTEN. Where does the railroad begin with reference to the reduction plant and where does it run—the terminal railroad?

Mr. Fox. The terminal railroad was built as a belt line from Alton around to East St. Louis. It has been built up to the Vandalia Railroad, and the Vandalia Railroad has been fighting the crossing there for the last two and one-half years, and that's the reason it hasn't been built—

Mr. AUTEN. Where is the southern terminus of the railroad?

Mr. Fox. The southern terminus of the railroad is practically at East Carondelet.

Mr. AUTEN. At your docks on the river?

Mr. Fox. At our docks on the river.

Mr. AUTEN. And the cost of \$1,500,000 you have mentioned includes the cost of that and what you have expended on the docks on the river?

Mr. Fox. Yes, sir.

Col. TAYLOR. That \$1,500,000 has been spent—

Mr. Fox. Every dollar of it by our company. We built the belt line, bought the river front property and paid something like \$135,000 for the river front—good, solid cash. I paid for it.

Col. TAYLOR. Does the Aluminum Co. own the—

Mr. Fox. The Aluminum Co. owns all the stock of the Alton & Southern Railroad, just the same as it owns all the stock of the Bauxite & Northern.

Col. TAYLOR. They have got the water-front condition sort of tied up in St. Louis.

Mr. Fox. No. As I say, there's 20 miles owned by the Terminal Railroad Association, which is owned by the 23 railroads which come into east St. Louis, and they haven't got a dock.

Col. TAYLOR. Where does the public come in?

Mr. Fox. The public don't come in. The Terminal Railroad Association don't build any docks. They have got a levee built there so that you can't build a dock any more. We had to go below the levee district to get to a place where we could build a dock. You can't build a dock on a sloping levee, you know. The Terminal Railroad Association, owning that river front, is owned by railroads which parallel the Mississippi River.

Col. TAYLOR. Then they won't encourage the building of docks?

Mr. Fox. They won't encourage the building of docks, and I wouldn't, either, if I was president of a railroad paralleling the Mississippi River.

Col. ABBOT. Why does the Alton & Southern come in there—for general benefit—

Mr. Fox. The Alton & Southern does it primarily for its own benefit—for the benefit of the Aluminum Co. interests—but it's like all those propositions: If we don't get any outside business, it's a pretty heavy investment for our own business. We expect to develop—

Col. ABBOT. You expect to derive a revenue from the use of this terminal which you put in primarily for your own protection?

Mr. Fox. Yes, sir.

Col. ABBOT. And you let other people in, not from general charity, but because you can get money out of it to help support your own expenses of your own terminal?

Mr. Fox. Yes, sir.

Col. ABBOT. What limitation and what guarantee has the general public got as to what you are going to charge them for your facilities there?

Mr. Fox. The charges are limited by the Interstate Commerce Commission and the State commission.

Col. ABBOT. So you have to keep it open on equal terms, which are under the control of those bodies?

Mr. Fox. Yes, sir; we have to.

Col. TAYLOR. You have that railroad for the purpose of building up a river business?

Mr. Fox. Primarily to get to the river.

Col. NEWCOMER. You use it in handling your present rail traffic, I suppose?

Mr. Fox. We do; yes, sir; and we are trying to get interchange traffic with other railroads. The other belt lines closer in town being built up the service is very much slower. No large interests have located on these belt lines in the last five or six years. We have locations for new industries.

Mr. AUTEN. Will you kindly state to the board what the intentions of your company are in regard to this railroad traffic—if you haul your bauxite to East St. Louis by barges, what your company intends to do about return traffic and whether or not the Arkansas River would be a much more profitable stream for you for return traffic, and why?

Mr. Fox. I wonder anybody asks that question. If we have got barges coming down the river and anybody has got any freight to offer we will take it. It will very much reduce the cost of operations. We are not going to bring the barges down light if anybody has any freight to offer. Naturally all related products, like coal and cement and other materials that are easily handled, would be the complementary cargoes to bring down.

Mr. AUTEN. If the railroad rate were \$1 a ton, you could haul this freight in competition?

Mr. Fox. No question about it. You could bring your cargo over to our dock and put it on it and take the crane and drop it aboard and take it away. That's the great trouble now. A man has got to bring the stuff to East St. Louis and take it down to the levee and handle it.

Mr. AUTEN. At what cost can you get steaming coal delivered on your docks at East St. Louis?

Mr. Fox. At an average price the year around of probably 90 cents. Some months of the year we buy coal there for our boilers—screenings—put in our bunkers, for 45 cents. In the fall of the year, when there's a great demand for lump coal, I've seen it come into East St. Louis and have bought it for the freight, 32 cents.

Mr. AUTEN. Comparing those prices—what it can be delivered to East St. Louis for—and the Arkansas prices at which it can be handled——

Mr. Fox. I understand we pay something like \$3 a ton for Arkansas coal at our bauxite mines.

Mr. AUTEN. At what cost could you deliver the East St. Louis or Illinois coal here if you were running barges on the river?

Mr. Fox. I wouldn't like this to go into the record, because when some fellow goes to put a price on it he might look up this record.

Mr. AUTEN. I was asking what the cost would be, and not what you would charge. Could it be delivered in Little Rock at a much lower cost than the Arkansas coal?

Mr. Fox. Undoubtedly. I should say you could deliver it here for \$1.50 a ton, anyway.

Mr. AUTEN. We have with us Mr. F. B. T. Hollenberg, and will ask him to make a statement to the board.

Mr. F. B. T. HOLLENBERG. I haven't given this particular matter at this time much study, although several years ago I appeared before the board of engineers that was down here, and at that time I had assembled quite a number of facts and figures, but they have entirely gone from my mind. So it isn't for the purpose of giving you any particular data that I now speak to you, but more from the general aspect of the case.

The situation, as I view it, isn't one of objection to railroads. It is, on the other hand, a very great benefit to the railroad—the very fact that by the navigation of the Arkansas and the White we can handle the low-grade com-

modities in large quantities at a price at which they do not make any profits, thereby relieving the situation of car shortages and other objections that occur—the cost of moving these materials, of handling coal and bauxite, and all other low-grade commodities in great quantities, instead of loading up their expensive systems of doing business with the low receipts from this material. It really puts them in the position of having them properly cared for by the water navigation, thus giving to the railroad the opportunity and the chance of handling the higher-grade commodities upon which there is a profit to the railroads; and it is a well-known fact, I believe, that the channelizing of the waterways in Germany and in other countries hasn't decreased the revenues of the railroads, but, on the other hand, has enhanced them; and that is the view I take, that if we were coming down here to destroy one of the greatest factors that we have for progress and the building up of this country, namely, the railroads, I would say, "Heaven forbid"; but, on the other hand, if I say to you and if you believe that the making of these rivers useful is not a detriment to the railroads, but, on the other hand, is a benefit to them, I should say, "Gentlemen, it is certainly the part of the Government, and you, as agents of the Government—it is your duty to provide the ways and means to do it." The question of whether it's a few thousand dollars more or a few million dollars more isn't so much the point; the thing is, is it feasible, can it be done, will the results justify it, are the communities along it benefited by this great improvement, will it be of continuous and material benefit to the people? If so, it must be done; and while we beseech and implore you gentlemen to do it, we feel that we are entitled to put even a little stronger pressure to the words and say we hope you will go into it on that point.

It isn't for the purpose of complaining of the conduct of the railroads in the past, but I will say that this section has been unfairly treated. By the efforts of its representatives to manipulate legislation, one of our railroads has created a great deal of antagonism. I was speaking to Mr. Bush the other day. He was complaining about the actions of Arkansas in the matter of freight rates. I said, "Mr. Bush, I would like for you to admit or deny the statement I have heard frequently, namely, that the Iron Mountain has paid the losses of your Missouri-Pacific and Denver & Rio Grande when it was in trouble, and the Western Pacific. Is that true?" He said, "We don't make any more out of Arkansas than we are entitled to." I said, "Be specific. How much do you make out of Arkansas? If you don't want to answer the question, you can turn it aside." He said, "We don't make more than 4 per cent on our Arkansas roads." I said, "Do you make anything like that on your other roads? On what basis do you make your 4 per cent? Is it on the basis of the actual cost of your railroads or 10 times that in watered stock? Will you answer those questions? You are making 4 per cent; you have got an alternate section of land for all your miles of railroad on the Iron Mountain in Arkansas. Do you credit any of your present cost of your railroad with the receipts you have obtained from the sale of land? Have you decreased the bonds and stocks? The sum and substance is, you are paying 4 per cent on a one-tenth valuation and the people of Arkansas are paying you 40 per cent very much closer than they are paying you 4 per cent on the actual cost, and that's done on the business in Arkansas and through Arkansas by the Iron Mountain."

As I say, I want the railroads considered, because they are the greatest factors of development; but, at the same time, we are not looking after the railroads. The railroads will take care of themselves, as they have very frequently done heretofore; because, as soon as we would start a little navigation plant, by some peculiar movement of the machinery of rate making the project was immediately choked, as in the case of the movement of bauxite to Devall Bluff, mentioned here this morning. They have got lots of brains and money and time, and they work the thing out. But I am not criticizing them. But there is another feature. Mr. Sengel tells you there is only 15 per cent of our acreage under fence. We all know, and it is a fact, that the value of the produce raised annually per acre in Arkansas will approximate, year by year, throughout the entire State, 100 per cent of its value. That is not true of any other State in the Union. Take \$150 and \$200 an acre lands in Iowa and Illinois and they will not produce a gross return of over possibly 30 or 35 per cent. Why is it true that so little of our land is in cultivation? And what is the remedy? We should prevent the railroads from keeping us throttled up on the question of rates, as they have done, not to their benefit but to their discredit and their loss, because the greater Arkansas will grow the greater the railroads will grow, and, secondly, if you can give us, through water transportation, an in-

creased commerce, the railroads will have a doubly and triply increased commerce and their profits will be much larger. So you are aiding the railroads. I can't understand—can't see the theory of the railroads which say that by throttling a growing community they are enriching themselves. It would be well if they would increase immigration. And that, gentlemen, is going to come sooner or later, and water navigation will be the greatest thing to bring that about, because if we can bring our commodities in here cheaply and take them out cheaply, industries, manufactures, increased population will come, and the value of our products will increase from \$350,000,000 and \$400,000,000 to \$1,500,000,000 or \$2,000,000,000 a year, because we have got all the natural resources, fertile soil, the climate, and everything; and it is the duty of the Government of the United States, when we have such great possibilities here, when the expenditure of a few million dollars—say \$20,000,000 or even \$30,000,000; some men said \$30,000,000—\$30,000,000 isn't a great sum when they can spend \$100,000,000 on other things that are not so meritorious—why is Arkansas not entitled to its share of the money? We don't criticize the Government for doing something for somebody else. We have the advantages, we have everything at our doors, we are as great and glorious a community, we are as patriotic as any. Arkansas supplied the first regiment that was ready for service in 1898 in the Spanish-American War. We are with you. We are all one. All we want to do is to grow. We have got a natural waterway; we have got everything here; we just want the United States Government to see what we can do with their help.

Col. BLACK. It is now 1 o'clock. We will take a recess until 2 o'clock p. m.

AFTER THE NOON ADJOURNMENT.

Mr. AUTEN. Gentlemen of the board, I wish to present Capt. Joe Evans, of Dardanelle, an old steamboat man.

Capt. JOE EVANS. Gentlemen of the committee——

Col. BLACK. Tell us something about freight rates in the old days.

Capt. EVANS. I am 82 years old——

Col. BLACK. Nobody would think it.

Capt. EVANS. I have been steamboating since 1852. I commenced on the Cumberland River. I steamboated on the Cumberland, Ohio, Tennessee, Mississippi, and on the Arkansas. When I came to Arkansas Napoleon was a town almost as big as Little Rock—it's gone now—in July, 1860. I knew the condition of the river at that time thoroughly, and have since that time. I will briefly state I commanded the snag boat *Wichita* in 1882 for Capt. H——, who was in charge of the engineers' office, and was ordered to go to Arkansas City, Kans. I never went there, but I went farther up the river than anybody else ever did go. That was a pretty good-sized snag boat, about a 200-ton boat, a small boat for those days. I got to Coffeyville Landing, tied to an oak tree, and remained seven months. It was dry, so I could walk across both above the boat and below it. That was in the fall. In the spring or summer I got back by waiting for a heavy rise. We got a 6-inch rainfall in 30 hours and floated down. In coming down the river—I have a reason for stating this—the only way I could get down that river was to watch the drift logs that were drawing more than I was. There were a few drift logs up in that country. Most of it was prairie, but higher above there was a timbered region. So I would follow one until it lodged, and then I would go after another. I found that river very difficult; in fact, from the bridge at Muskogee up there were something over 900 islands and towheads. In other words, I found the water scattered all over that country, and after you got up beyond Tulsa the banks were not much higher than that table. The Indians would wade across, ford it with their ponies, and step out on the bank.

But, to get back to my river at Napoleon: When I got to the Arkansas River I found a line of boats running from Memphis to Little Rock, from St. Louis to Little Rock, from Cincinnati to Little Rock, and from New Orleans. I say "to Little Rock." I will change that. I will say to Fort Smith and Gibson. Nearly always we had freight to Fort Smith. When we got there we would go on to Gibson. That was a very important military post at that time. So I found the river in low water much deeper than it is now, a great many snags in it and very difficult to navigate, but we had water seldom ever less than 2½ or 3 feet. The Government commenced snagging the river then. The war came on. There wasn't much doing during the war. However, I was chief of transportation and was on the river all the time. I kept posted on it. At that

time we had no railroad. There was no railroad in the State of Arkansas. There wasn't a mile of railroad in the State of Arkansas, except a little piece from here over to Devall Bluff, and then you would get out and go over toward Memphis and get a train and go into Memphis. I still continued steamboating. Directly after the war closed they built this Cairo & Fulton road, which is the Iron Mountain now; then they built this road from Little Rock to Fort Smith. That was built—completed about 1874 or 1875. Up to that time we had very good steamboating and usually had water. On a few occasions we had to haul freight from this point and to all points above here to the military points.

Mr. AUTEN. Can you tell us about freight rates?

Capt. EVANS. I am almost to that. I am not going to occupy over 10 minutes.

Col. BLACK. Go ahead, captain; you are very interesting.

Capt. EVANS. What I tell you is from observation and simple facts. I have retired from business, but I have an interest in the community in which I live. When they got this Fort Smith road finished there was competition. The boats still kept running. We had a line of boats from here up there. We hadn't discontinued them. The railroads discriminated against the river points and cut the rate down so some of the boats withdrew. And right there I want to say that Converse, who was president and represented the Fort Smith & Little Rock road, concluded he would put in a line of boats. He sent me up north to buy those boats for them. I wouldn't agree to take charge of those boats—he offered me a round price to do it—unless he would put on those boats "railroad line," so there would be no deception. I had been a steamboat man all my life and understood transportation. He wouldn't do it. So he failed to get the boats. In the meantime, there was a change in the superintendency of the road. Mr. Wood, who came in—the boats that hadn't been already thrown out by this discrimination were bought by Woods straight out, and they made two or three trips and laid up. He chartered me one of them; and I went down and did work on the Mississippi River for some time—contract work. That was what stopped the transportation on the Arkansas River at that time. The law wasn't as good then as it is now. They put the price down and bought these boats out. Occasionally a man would bring in one or two boats. That was 15 or 20 years ago. He would make one or two trips. They would take freight from river points at any price.

I saw a party in here this morning who was traffic manager of this line that carried six carloads of freight for $6\frac{1}{4}$ cents from the wharf to Russellville when they were charging 35 for the same class of freight. That's what stopped those people from running steamboats. That's one thing. And, of course, the river was getting shallower all the time and more difficult for want of improvements, and this discrimination that was allowed to run up to this time. The Interstate Commerce Commission didn't interfere with it. All these lines of boats were doing a thriving business when they came on the river. To-day there isn't less than 10, 20, 50 times the freight on the river. The railroads handle it, and it could be handled as well by steamboats. As far as prices are concerned, the river charges about 50 per cent of what the railroads do. Take it all the way around, it would be just about half. But this discrimination is going to stop. The State won't stand it I know. They will stop it if they haven't already done so. I haven't noticed in the last year or two. In fact, I haven't done anything in the last year or two except take care of myself and breathe mountain air up there. We want a river that we can handle boats on. We have got the same normal rainfall we had at that time, 65 years ago. Now, if we can get the same amount of water we had, boats can get in here at a great reduction from railroad prices and make a living and do well and accommodate people who are greatly inconvenienced now by the railroads, notwithstanding we have got some on both sides of the river within say 5 to 15 and 20 miles. I can state divers causes for this condition, but this one ought to settle it; they were taking freight at any price against the river. That was one thing. It wasn't altogether for want of water. Of course, a large business was done then. There is nothing moving to-day. You all know that. There is no use to make these statistical reports. It's all right to make them to show what we have got on hand to move. I don't think there has been a statistical report here this morning that I heard that is overdrawn at all, and, so far as some of them are concerned, they might be multiplied by 10. There is an immense tonnage that will come out of the Arkansas River when we get in a condition to move it.

I have heard a great deal about Ozark. I want to tell you gentlemen you have got just as good water from here to the mouth of the Grand River as you have anywhere else. I know what I am talking about. In fact, the river would be so much more cheaply improved from Fort Smith to Muskogee, the mouth of the Grand River, than it would any other portion of the river. Even below Pine Bluff it couldn't be done as cheaply as it could up there.

I want to say another thing; it isn't going to be very popular and I may make some enemies by it, but I know from observation that there is no navigation above the mouth of the Grand River. The Grand River furnishes more water at a low stage of water than the Arkansas at all stages. There is the Verdigris and the Cimarron. The next greatest flow of water above there is Walnut Creek. When I went up on this special trip, when I was laying up all that winter on that sand bar for the Government, I had to go overland to get my money—to Arkansas City—to pay off every month. One trip I went up to Wichita. I want to tell you I couldn't see any water in the river. There were some holes. There were places you rode your horse across, and if you wanted to water your horse you could get down and dig a hole and get water. Sometimes, of course, in a flood there was water all right, but a great deal of the time there wasn't. There is no bed for the river if the water comes. When I came out that trip, in coming back to the mouth of the Grand River and coming back down home, some days I couldn't see land at all except little patches—tow-heads, islands. But it is possible, and feasible, to improve this river to the mouth of the Grand, and it can be done cheaply. There's any amount of material, but, of course, you engineers all know that. There's no use to speak about that.

Col. BLACK. We are much obliged to you, Captain.

Capt. EVANS. If there is any point that you want to ask any question about, there's nothing about the river from 1855 up to date but what I can answer.

Mr. AUTEN. The time is exceedingly short and we have two other river captains who have been on the river for many years, and while I dislike very much to ask them to limit their time in discussing this matter, on account of having so much data to present, I will necessarily have to ask them to be as brief as possible. Capt. H. C. Daniels.

Capt. H. C. DANIELS. Gentlemen, I have been steamboating on the Arkansas River since 1868 up to the present date. Now, relative to what we have had, I can say within my own experience we would have an average of three to four boats a week from here to Memphis making weekly trips. In my own experience I was on the steamer *Pat Cleburne*, that made 52 consecutive trips here in the year 1870 or 1871—I forget, now, which—between here and Memphis. At that time we had no railroads—

Col. BLACK. What did the *Cleburne* draw, Captain?

Capt. DANIELS. The *Cleburne* drew about $3\frac{1}{2}$ feet light. With a full cargo she would draw about $5\frac{1}{2}$ to 6 feet—not over 6 feet. The traffic at that time, on account of there being no railroad here, was practically everything that came into Little Rock.

Now, what we can do with a good permanent stage of water from here is a question that I could hardly answer conclusively, but I will say this, that we could do anyway—a boat line would do from 20 per cent to 25 per cent of the traffic in and out of this city. The traffic people can better say what it amounts to. We have from \$1,500,000 to \$2,000,000 a year here.

Col. BLACK. How much water would you want?

Capt. DANIELS. A stage of $4\frac{1}{2}$ or 5 feet, with the character of boats that we could make now, that would be some improvement on the old-style boat. There are quite a number of improvements in the construction of steamboats now. I have had practical experience with the effects of what the present dredge boats have done in this river in the past 18 months, and my experience has been that they have done good work, and, wherever they have done work they have made a channel which, for the time being, was permanent. It has had good effect. I think that the maintenance of the present dredge boats, perhaps augmented by one or two additional ones, and proper snagging, will produce good navigation from Little Rock to the mouth of the river, at least.

You gentlemen have heard relative to the coal fields above here. There are but two permanent bars that are of a bad character between here and the coal fields, and I think there would be no trouble, say for six or eight months in the year, to have good navigable water between here and there.

Col. BLACK. What would be the depth?

Capt. DANIELS. That would be an average of about 5 feet, using barges that could be loaded to a depth of 4 feet.

Col. BLACK. It wouldn't pay to use lighter-draft barges in that traffic?

Capt. DANIELS. No, sir; I wouldn't think it would. You could put on, perhaps, 12,000 bushels of coal to the barge.

Col. BLACK. We are very much obliged to you, Captain.

Mr. AUTEN. I want to introduce to the board Capt. Jeff Hicks, of Pine Bluff, also an old riverman.

Capt. JEFF HICKS. By profession, I am a steamboatman, an old pilot on the Mississippi River. The gentlemen just before me are more familiar with the Arkansas River than I am. I was a pilot on the Mississippi from St. Louis to Orleans in the old days—that is, in the latter part of the palmy days of the steamboat. I now have a little boat running north of Pine Bluff and one running south of Pine Bluff, I believe the only two boats running on the Arkansas River to-day, operating in the packet trade. Mine is a little towboat with barges; Capt. Myers's is a packet boat. I only go to a landing called Wildcat, about 35 miles north of Pine Bluff—run pretty regularly. Of course, at seasons of the year the river gets low, and, in building this boat, I undertook to build a boat to suit the river. It seemed to me it would be a pretty hard job to make the river suit the boats, so I undertook to operate on that plan. I am running pretty regularly, right along, and have been for the last two or three years, and expect to continue; but, from observation and my experience with the Arkansas River, from what I have seen of it in the last two or three years, the Arkansas River is a much different river from our other rivers—much more like the Missouri River—stiffer currents, shallower water, and such things as that.

During my days on the Mississippi, I ran out of Orleans on these larger boats, such as the *White* and the *Natchez* and the *Robert E. Lee*. Of course, that was the latter days. Those boats were very heavy craft—drew as much as 9 feet of water at the sternpost. I have seen as low as 9 feet at the mouth of Red River before the Government undertook to take care of the river and get better conditions—undertook to revet the banks—and the Mississippi is revetted for miles and miles. By that, it prevented the banks from caving in. When a bank caves in a river that causes a shoal. If it continues to cave at a bend, it keeps piling up and piling up. That's what brings so much shoal water. If the bank caves in, the timber caves in. That brings snags. The result is, you have got shallow places and your river is full of snags. I don't claim to say that the revetments protect the banks forever. They keep them from caving continuously, all the time, and from time to time the revetment is repaired. If a place caves in, of course, it's repaired. I don't know that there has been less than 18 feet at the mouth of Red River since the Government took charge. I have seen 6 feet at Natchez Island, where we have had trouble getting over with those large boats in the old days—the *Natchez* and the *Lee*. I understand from pilots nowadays that they never have less than 12 to 14 feet. That work keeps the banks from caving—this revetment work. It never caves. If you don't put anything in the river, you don't have to take it out, snags or anything else. In my experience on this river, what little short distance I run north of Pine Bluff, wherever I find a caving place above, the bank caves and settles below; that fills up and you have got a shoal place, maybe a foot and a half or 2 feet. My little boat runs on 20 inches. Of course, I built the boat to suit the river, because I had to go, and I have been going ever since I built her, and am going to continue to go. From what I can see about this river, or any other river, if you can just protect the bank from caving in, the timber won't cave in.

Col. BLACK. Do you know how much that revetment work costs?

Capt. HICKS. I suppose it costs a good deal.

Col. BLACK. Well, in Missouri the estimated cost is \$50,000 a mile, where they have one solid bank that they don't have to protect. Here we would have to protect both banks.

Capt. HICKS. That isn't every place. If you stop one bank from caving, the current isn't so swift in the next bend; the water doesn't travel so fast. The river travels just like a billiard ball. It hits that rail and rolls out, and hits the other one and rolls back. Sand travels just as the water. The caves in this river are not as long as they are in the Missouri or Mississippi. I don't know of that bank north of Pine Bluff caving—in the 30 miles, I don't suppose there's three-quarters of a mile. In some places, of course, it caves worse, and much longer caves.

Col. BLACK. We are much obliged to you, captain.

Mr. AUTEN. I am just in receipt of a communication from The Lakes-to-the-Gulf Deep Waterway Association, which I am requested to present to the board. As the resolution is very short, I will take the time to read it and then will file it with the board.

RESOLUTION OF THE EXECUTIVE BOARD OF THE LAKES-TO-THE-GULF DEEP WATERWAY ASSOCIATION.

"Whereas it has come to our attention that a recommendation has been made by an officer of the United States Department of Engineers that all work of improvement on the Arkansas River be abandoned on account of there being, in his opinion, insufficient commerce on the Arkansas River, present and prospective, and,

"Whereas the Arkansas River is one of the great arms or tributaries of the Mississippi River, and to pronounce the Arkansas River unworthy of improvement is taking from the great Mississippi itself a portion of the importance of its improvement, and thereby practically pronouncing against the improvement of all inland waterways, which pronouncement we earnestly believe springs largely from an ignorance of those causes which contribute to the national commercial prosperity and is so necessary to the development of the great natural resources which abound undeveloped throughout the length of the great Arkansas River; now, therefore,

"*Be it resolved*, That we most earnestly protest against this proposed abandonment of this great stream, and that the great political and commercial inquiry as to the need or necessity of any contemplated improvement be left to Congress, whose determination may then be based upon knowledge of general conditions and upon evidence obtained from the communities to be affected by the improvements proposed.

"THE LAKES-TO-THE-GULF DEEP WATERWAY ASS'N,
"W. K. KAVANAUGH, *President*."

We have with us to-day a man who might be called an expert on the coal business of Arkansas. He was an expert miner when he came here many years ago. He has been connected with practically all the coal mines of Arkansas, and, while the time is limited, I am going to ask him to present a little paper he has prepared as to the quality and quantity of the coal in Arkansas, and also what might be done on the river if transportation is established. Mr. Hoyer, kindly come forward.

Mr. JAMES P. HOYE. Gentlemen of the Board of Engineers: If I understand your mission down here, it isn't to determine whether the Arkansas River is feasible for navigation, but to find out whether or not there is sufficient tonnage to justify the expenditure by the Government, and, if there is sufficient tonnage, whether or not a large enough proportion of that tonnage would be shipped by the river.

I would respectfully ask your kind indulgence to listen to a few facts in connection with the coal industry of Arkansas. [Reads Exhibit M.]

Col. NEWCOMER. I understand that you were about to enter upon the shipment of coal upon the river as it now exists.

Mr. HOYE. We were getting ready. Mr. Patterson and I acquired an option on 500 acres of coal land—

Col. NEWCOMER. I mean this proposition of Mr. Mayo.

Mr. HOYE. It was after the Government had made this appropriation.

Col. NEWCOMER. That didn't contemplate any permanent improvement; that simply contemplated something like three and a half or four foot channel.

Mr. HOYE. Even so.

Col. NEWCOMER. You proposed to operate under those conditions?

Mr. HOYE. Yes, sir.

Mr. AUTEN. Now, gentlemen, we are nearing the end of this testimony. I wish to present to you for the next and last detailed statement Mr. Carl Baer, who is secretary of the Arkansas River Improvement Association and also secretary of the Chamber of Commerce of the City of Little Rock. In doing this I wish to state to the board that Mr. Baer has been sent over the rivers of the South probably more than 10,000 miles of travel and investigation for the Chamber of Commerce of Little Rock, to find out what there is in sight for the future of Little Rock, what improvements have been made in river transportation and in boats, and what river conditions are; so perhaps he speaks more advisedly than any other man in Little Rock on this subject.

Mr. CARL BAER. Gentlemen: After four years of work on this project I am glad to be able to meet this board and to submit to them my opinion of this important matter.

There are so many things of importance to bring before you, as you will see here on my desk the records and figures of river statistics compiled during the past four years. It would be useless to attempt to tell the contents of these papers in detail in the 30 or 40 minutes' time allotted to me. I am,

however, going to ask the privilege of submitting to you later on the entire record (Exhibit N), and if in the future I can be of service to you in interpreting any of these figures or the data submitted, I shall be glad to render that assistance.

I am to-day, after hearing from Mr. Sengel, of Fort Smith, and those gentlemen from up the river, more than surprised at the volume of tonnage shown in their reports. I thought I knew something of the tonnage on the Arkansas River, and particularly as a timber man during the past 10 years in this State I thought I was pretty well posted on the merchantable timber accessible to the Arkansas River, but I find that the reports submitted far exceed in tonnage my ideas of the estimates.

I was a layman in so far as the bauxite and the stone tonnage is concerned, but these two items alone will, in my opinion, warrant the improvement of the river. The agricultural products which we are going to submit to you to-day available for shipment on the river are considerably more than we had anticipated.

The methods of transportation, the devices to be used on a shallow river, the engineering problems to solve to accomplish permanent navigation on shallow streams are too great for me to undertake a thorough discussion of at this time; but the first thing I desire to speak of is the freight-rate fabric which exists West of the Mississippi River. I would not be serving this public fairly after having represented the Little Rock Chamber of Commerce as its industrial commissioner and secretary during the past four years, and now acting secretary of the Arkansas River Improvement Association, unless I at this time impress upon your honorable body the geographical position of Little Rock and our Arkansas cities, and the gross discrimination against us on railroad freight rates. Gentlemen, I say this within the hearing of some of my good railroad friends, and I trust they will understand me fully, that I do not want to handle this proposition with gloves. It is too vital to the entire citizenship of this community not to give it earnest and careful consideration.

If you will draw a line along the south part of Missouri and follow it to the Pacific coast, then follow from the east Missouri line down the Mississippi River to New Orleans, the territory south and west of these lines lies in a district which, in my opinion, is vitally affected by the present high freight rates. Here in the State of Arkansas, a territory nearly 300 miles square, we find the vast resources of stone, coal, bauxite, timber, minerals, and cotton, besides the unlimited quantities of agricultural products—and increasing in quantity each year—the State is developing.

We must receive some recognition from the Interstate Commerce Commission on this freight-rate proposition, and if we could establish on the Arkansas River permanent navigation and place a transportation company permanently there as a common carrier, we would be in position to haul hundreds and thousands of tons, and that class of freight at a profit, at a materially lower rate than the railroads are hauling it for, which commodities are not profitable for railroads to carry. The situation, gentlemen, is practically paralyzing the industrial and agricultural development of this section.

I feel that I am representing 70,000 people in the city of Little Rock, and that these 70,000 people should know of this condition. You might answer me that the manufacturers and shippers are certainly in position to watch and correct such conditions. In reply to this, I see Mr. Dickinson in the audience. He represents a brick and stone industry, and is possibly aware of the freight rates on those commodities, but I venture the assertion that he is not familiar with the freight rates on thousands of commodities shipped into this city. Again, I see Mr. Heiman here, representing the largest department store in this city. He probably knows a great deal about freight rates on particular commodities shipped to his firm, but I feel certain that he is not aware of the gross discrimination against Little Rock on freight rates as compared to Memphis, Tenn. Therefore I am asking your honorable body to give most careful consideration to this rate situation and to the exhibits on freight rates which we are submitting to you to-day and which will become a part of the record in this case. One paragraph of a letter I have before me from Mr. A. R. Bragg, traffic manager of the Merchants' Freight Bureau in Little Rock, I would like to read to you. It is as follows: "You will note the rate from New York to St. Louis is 92½ cents per 100 pounds, about 985 miles, as against the rate of \$1 per 100 pounds from St. Louis to Little Rock, a distance of 365 miles." You can see from this that there is something wrong somewhere, and it is not for me to say whether or not the Illinois Central, the B. & O., the Pennsylvania, the Wabash,

or the Big Four Railroad are carrying this freight at 92½ cents at a loss or whether or not the Iron Mountain and Rock Island are making more money than they should in carrying the freight 365 miles at \$1 per 100 pounds; but it is reasonable to assume that if the eastern railroads can operate on 92½ cents and haul commodities 985 miles, these roads in this State could haul the same commodities 365 miles at a much less rate than \$1 per 100 pounds. The example submitted to you gentlemen is so striking and shows such unfairness that I am compelled to again state that it is vital in this case and must be corrected.

Again, if you will carefully analyze the exhibits on freight rates submitted by Mr. Taylor, the traffic commissioner of the Pine Bluff Traffic Association, you will see that we are paying, as Senator Clarke has said, from 30 per cent to 300 per cent in excess of other cities, particularly Memphis, Tenn. I will admit the 300 per cent differences apply only on some commodities shipped from Nashville, Tenn., to Memphis, as against the same commodities shipped from Nashville to Little Rock, but most of the commodities shown in the freight exhibit I am submitting to you, marked Exhibit N-1, show at least 100 per cent more for Little Rock than for Memphis, Tenn., on first-class commodities from St. Louis, Louisville, Cincinnati, Nashville, Pittsburgh, and Chicago. This in itself is sufficient reason for the stifling of the industrial and agricultural development of this commodity.

Mr. Hoyer, who has had 20 years' experience in handling coal in Arkansas, and who for many years handled coal on the Kanawha, has told you in his report to-day that the coal can not move from the Arkansas Valley east and south unless the river is opened; that the freight rates are prohibitive and will not justify the movement. This is another great factor in this development. He further says that we have 800,000,000 tons available to the river, that this coal is of a superior quality, and that most of it lies where it can be easily handled from the mines to the barges. Certainly this is a most favorable condition for this great amount of tonnage.

Gentlemen, we could not have told you a few years ago that we had 10,000,000 tons of bauxite at our doors. We could not have told you that nearly 1,000 tons of this bauxite is being shipped daily to East St. Louis, Ill. We could not have told you that this same bauxite is the means of supplying 60 per cent of the world's consumption of aluminum, but if Little Rock is so fortunate as to be located within from 3 to 16 miles of the natural bauxite fields of the Western Hemisphere, and if there is enough bauxite here to last half the world a lifetime, then we have the right to ask the United States Government to participate in the expense of making ready for navigation a stream of water to carry that ore to the markets of the world. Mr. Fox, of the Aluminum Co. of America, has testified to-day that they are moving 240,000 tons of ore per annum from Arkansas to East St. Louis at a cost of \$2.20 per ton. He says further that he believes it possible to move this bauxite by water at a cost of \$1. I do not care to argue this particular part of the case, but I will state to you that if the Aluminum Co. of America can move this tonnage at \$1.50 from Little Rock to East St. Louis, it will mean a saving of \$500 or \$600 a day to that company, and place that company in a far better position to compete with France, England, and Germany in the sale of aluminum throughout the world; and, after all, should we not seek to place our home manufacturers and producers on a substantial footing, enabling them to compete with all foreign countries? Should we not prepare to move 1,000 tons of this ore from this port to East St. Louis and take advantage of this great movement of freight to produce more tonnage for the Mississippi River on which the Government is spending money annually for improvement? I say to you, gentlemen, that I think the promise of the movement of this bauxite is to-day a substantial asset which the Government must take cognizance of, and if the Iron Mountain or Rock Island can not carry this ore for these people at the rate at which they can carry it on water, we are certainly not inflicting a hardship upon these roads in moving it at a price which would lose them money to move it. You might answer me in reply to this statement that I am trying to shift this burden financially upon the Government, and asking you to appropriate \$10,000,000 to fix the river. My only reply would be that the aluminum is but a small part of the tonnage we have to move, and that once the channel is opened the Government will reap indirectly a profit far greater than the amount of money expended to improve the river.

Independent of the tonnage we expect from the Aluminum Co. of America about 30 of the merchants and shippers at Little Rock, Ark., offer now to be moved by river at least 5 times as much tonnage for the river as is now moved on the Missouri River by the Kansas City (Mo.) Navigation Co.

The city of Little Rock is about 100 years old. It has grown to a population of about 40,000 white people. If the freight-rate situation to this section of the country has materially interfered with the growth of the country, are we not entitled to receive substantial aid for the improvement of such a great by-way to commerce as the Arkansas River? We believe that the railroads will profit handsomely by this development, and the country along the lines of the railroad will materially increase the volume of their business and make up for any losses sustained in the lowering of the railroad rates. I am sure that if Little Rock could grow industrially to become a city of 150,000 people in the next 10 years, the Iron Mountain, the Rock Island, and the Cotton Belt roads would make more money on the increased volume of business at a lower rate than at the higher rate of to-day on the limited business they are doing in Little Rock.

I desire again to state that this particular territory is the most productive field for tonnage to move by river of any territory of the same size in the United States. I lived for 34 years on the Ohio River. I attended the first meeting over 20 years ago of the Ohio River Improvement Association; I have seen all of the development upon that river with its locks and dams, and though that river is not utilized as it should be in carrying freight upstream, I think this can be attributed to the small volume of river business on all of the inland rivers, and we can not hope to move freight upon these different rivers until each river project develops sufficient tonnage to make the interchanging of freight to the different river lines profitable. This will be one of the links necessary to strengthen the chain.

If the Federal Government is paying to improve the Mississippi River and is to spend, say \$50,000,000 on the project, it seems to me of vital importance in considering that expenditure to know how much tonnage can be produced from the tributaries of the Mississippi and what expenditure must be made to produce that tonnage. In this connection I desire to state that from the showing made to this board to-day the Arkansas River will produce as much as any of the tributaries to the Mississippi and should receive its proportionate share of Federal appropriations.

Mr. Fox and Mr. Finney, of the Aluminum Co. of America, have stated to you that their company has invested \$1,500,000 in a terminal at St. Louis; that possibly \$1,000,000 of this is in the terminal railroad that surrounds the city and \$500,000 in a line running to the river, including dock and river facilities for receiving freight; that this company has in mind the shipment of bauxite on the river; and that all of their plants in the United States are supplied from the raw material bauxite at or near Little Rock, Ark. Gentlemen, this is new tonnage. I say new tonnage because no engineering board which has yet been called upon to pass upon this project has ever had this tonnage submitted to it for consideration. The last time a recommendation was made to Congress by an engineering board, none of us knew how much bauxite there was near Little Rock. We didn't know the value of this material, and when we bring before you these gentlemen representing their great aluminum industry and you are told that they have come before you for business and to outline to you their plans for the future, we can not lay too much stress upon the importance of this volume of tonnage ready to be moved when the Government has done its part. Mr. Fox told you that they were moving annually 240,000 tons to East St. Louis, and that there is every reason to believe that this amount will be increased from year to year. He further states that he has every reason to believe that, at the present rate of consumption and shipment, there is sufficient bauxite in this particular district in Arkansas to last a lifetime, and that he believed that his grandchildren would not live long enough to see the bauxite of Arkansas all utilized. This company made an experiment last year, and moved by water via the White River and the Mississippi about 15,000 tons to East St. Louis. They accomplished it with wooden barges and the old-style towboats, and they moved it, including the rail-rate haul from their lines to Devall Bluff on the White River, at a less cost than the present railroad rate, the rail rate on that haul to Devall Bluff being 70 cents per ton. They had only temporary equipment for the loading into barges at Devall Bluff, and the river haul was made under contract with a towboat company, and it is presumed they made a profit. If the Arkansas River were made navigable, in all probability this company would build its own short line of railroad from the mines to Little Rock, unless a satisfactory rate could be secured from the railroads now running to the mines. I make this statement in order to show you gentlemen another reason for opening up

a permanent channel to the city of Little Rock, which is the nearest point on the Arkansas River to the bauxite mines of Arkansas.

Now, the question of the kind of boats to utilize on this river. I have consumed now 18 minutes of my time, and before closing I am going to ask the board to consider something on the boat situation. [Places blue print before board.] The question has been asked by members of this board several times, "Why have the boats gone out of business? Why, when the railroads came and placed a freight rate upon the commodities moved upon the river, why didn't the boats continue to do business?" In connection with this, I desire to call your attention to a few figures and facts. The old steamboat *Jim Lee*, now at Memphis, and running on the Mississippi River, is one of the most modern side-wheel steamers in use in the valley. She was built about 15 years ago. These side-wheels, two in number, are over 30 feet in diameter and 20 feet long, made of 4-inch oak timber and steel, and, with the shafting and equipment necessary to propel these wheels, she is carrying in the aggregate 80 tons of wheels and equipment. Figuring freight at a minimum of \$2 per ton, I claim that this steamer is losing \$100 per trip in being compelled to carry this extra burden for the lack of modern equipment and devices. There has been but little improvement in the past half century in shallow-river boats. The same old slide-valve engines, the same old equipment in paddle wheels, the same heavy constructions, and the unnecessary decks and cabins, make it almost impossible to operate boat lines in competition with railroads equipped with every modern appliance. The handling of freight off and on these boats by the old-time deck hand, and the lack of modern terminals and equipment to exchange this freight from boat to rail and from rail to boat, these conditions are the reasons for the old boat lines going out of business, and, in many cases, on many rivers, we find where railroad lines have placed boats upon the river for ruinous competition.

Mr. John H. Bernhard, a marine engineer of New York; Mr. R. C. Wilson, a marine engineer of New Orleans; and the engineering department of the Kansas City Navigation Co. have been for years working hard on this inland navigation project and striving to equip boats for the purpose. The citizens of Kansas City have expended over a million and a quarter of dollars in experiment. For many years it has been thought impossible to navigate shallow rivers with propeller wheels, on account of the wheels being placed so deep in the water and coming in contact with snags and sand bars, and not until the tunnel-type boat was invented was there much hope of using the propeller wheel in extremely low water. The open-type propeller, such as used on the Bernhard barges, are most practical in rivers such as the Mississippi, where, most of the year, there is from 7 to 10 feet in the channel; but on the shallower streams, like the Missouri and Arkansas, up to the present date the tunnel-type boat has been found most efficient. I will admit that there are still many modifications and improvements to be made in the self-propelled barge, and these changes will only come as time goes on and as mechanical agencies are brought into the field for inland navigation. The propeller-wheel tunnel-type boat has not until recent years ever been considered by the Government in solving the problems of inland navigation, but, in my opinion, it is now a most important factor and should be taken into consideration in deciding upon a definite plan for river improvement. The engineers now working on the problem are striving to bring the boats higher in the water and attempting to secure the best efficiency from the propulsion of the wheel. It is safe to figure that the tunnel-type boat with a 48 or 50 inch wheel can operate successfully in 20 to 24 inches less water than the open-type propeller. There is still a question as to the number of wheels to be utilized.

It is still a debatable question as to whether more efficiency can be obtained by fewer wheels of large diameter than by a greater number of wheels of less diameter; but these problems will be eventually solved. If you are not familiar with the tunnel-type boat, I would like to state, at the stern of the boat a steel tunnel is built, which tunnel covers the wheel and when the boat is stationary approximately 40 per cent of the wheel is out of water. When the wheel is in motion, the centrifugal force of the wheel gathers the water from in front through the tunnel and displaces it at the back end of the boat in a stream approximately the same size as the diameter of the wheel. The discharge of this volume of water from the rear of the boat propels the boat forward.

Mr. Wilson, a marine engineer of New Orleans, made the following test: That a stern paddle boat with its wheel running at 30 revolutions per minute, with a fixed head of steam, running in 18 feet of water, would slow down to 15

revolutions per minute with the same steam head and all conditions remaining the same, when the boat was operating in 7 feet of water. The speed of the boat was approximately reduced from 7 miles to $3\frac{1}{2}$ miles per hour, and the same quantity of coal used, showing conclusively that to operate the old paddle wheel in shallow water greatly increases the fuel cost of operation. I dare say that all of the steamboat men in this room know too well what I mean by "the shake of the boat" when you are approaching shallow water, but I am safe in saying that none of them ever figured the actual cost of operating the boat in shallow water as compared to the deep water. Nearly all steamships in the world are moved by the propeller wheel, and it is fair to assume that if we can apply propeller wheel propulsion to shallow river navigation we have made a great step in the advancement of operating boats on shallow streams. Freight boats on inland rivers handling freight in carload lots should not attempt to carry passengers at a profit, and if the modern shallow river craft will operate in the freight business alone, and do away with that excess weight in its cabin construction, substituting that cabin and deck space in weight with tonnage that brings an income, a very great part of this difficult problem will be solved.

I would not presume to outline a plan for the improvement of this river, or to criticise the Government for placing these two dredge boats on this river for the dredging of the channel. That is not my mission here, but I understand these boats have been operating only a few months in the year, at a great loss to the Federal Government compared to the results accomplished. If they are not the proper equipment, they ought to be removed and supplanted with something that is economical as well as practical, but I still believe these boats can be utilized in effecting a permanent channel where revetment of banks and permanent channel work has been completed. If smaller dredging devices can be utilized on short crossings which could cut quickly a narrow channel through these crossings, it would enable the large boats to be used in more permanent work and be the means of covering more territory at a less cost. In my opinion, with the modern mechanical devices for navigating these shallow streams, the engineering problems to be solved by your honorable body are not so difficult as they have been in the past when only the old type of steamboat was used.

You will see on the Ocmulgee River a boat drawing 6 inches at the bow and 22 inches at the stern light, when, loaded with 300 bales of cotton, it operates on about 30 inches of water. The fuel cost of operating this boat is 36 cents per hour, manned by 5 men on the day run and 4 on the night run, a total of 9 men in operating the boat 24 hours.

Another difficulty which confronts the steamboat captain, particularly on the Arkansas River, with its acute bends, is the steering of the boat around these bends and keeping the boat from the bank. With the paddle wheel, you will appreciate that the boat must have sufficient momentum in coming upstream for the steering device or rudder to be effective, and when a boat in a swift stream moves slowly, the rudder effect is practically nothing, and the boat, consequently, by the swiftness of the stream, is thrown into the bank. This does not occur in operating with the propeller-wheel boats, as all modern propeller-wheel boats are equipped with twin or triple screws. One wheel operating forward and the other reversed will control instantly the direction of the boat. Another factor of importance in crooked rivers: The engineers in charge of the Kansas City Navigation Co. have prepared to make a series of important tests on the Mississippi River with a tunnel-type boat now owned by the Government. These tests will be made in order to ascertain the number of revolutions per minute necessary to produce the greatest efficiency for the propeller wheel and other important mechanical tests.

We are planning now to build a modern steel barge with water-tight bulkheads, equipped with modern engines and wheels, and to make a thorough test of this craft on the Arkansas River, following, as near as possible, the plans and devices used by the Kansas City Missouri Navigation Co., as we believe the conditions on the Missouri River and Arkansas are similar. These self-propelled barges, as we call them, are also used as towboats. If more publicity were given to the many problems confronting us on inland navigation, showing the necessity for modern mechanical-boat equipment and gas, gasoline, oil, or steam engines, I believe such men as Mr. Ford, of the automobile company, would render the movement valuable assistance through his engineering department, as the automobile people of America have been able to solve many of our most difficult problems in mechanical engineering. The two things we have to consider are shallow craft and propulsion, but up to the present date there are but few men in America working on these problems, and I take this

opportunity to congratulate the citizens of Kansas City on the great work they are doing along these lines, spending their own money to solve problems for all of the inland rivers, and the time has come when the Federal Government must encourage such work as these men are doing in Kansas City. In my opinion, it is going to rejuvenate inland navigation on the waters of this country. The United States, with the Panama Canal just finished, is practically walking on one leg, the other leg being the Mississippi River and its tributaries, and unless we are willing to improve these rivers to complete the water route from the Lakes down the Mississippi and to the canal, we are going to greatly impair the progress of these Central States.

Mr. Roosevelt advocated completing the Mississippi River with the depth of a 15-foot channel. This would cost hundreds of millions of dollars. I claim to-day that, with the present channel in the Mississippi, a moderate expenditure on improvement, utilizing the modern craft for navigation, and the building of terminals and equipment for the economic handling of freight, will accomplish the results and be the means of completing the water route from the Lakes to the Gulf and through to the Canal, and that the United States will then stand upon two legs instead of one. I again say let us not in this country spend millions of dollars on the Mississippi River unless we expect to navigate its tributaries.

I am taking up too much of your time, but the crying need of these 70,000 people whom I represent is development. I am making no apology to the railroads, for I firmly believe that the opening up of this great river will be of material assistance to them. And before closing let me state again that as we are supplying one-half of the world with aluminum from near this river, with the coal field of 800,000,000 tons lying along the river, with 120,000 tons of stone used by the Federal Government last year on the Mississippi River below the mouth of the Arkansas, with the quarries in operation on the banks of the Arkansas at Little Rock, and an unlimited supply of stone at hand, with the timber resources that you have before you, I believe our case before your honorable body has been well established.

I desire again to offer my services at any time to this board in assisting to interpret or to analyze the figures submitted in this record, as in my opinion no more important matter has ever come before your honorable body than the permanent improvement of the Arkansas River.

Mr. AUTEN. I am going to ask leave to file a short brief [Exhibit O].

Col. BLACK. Can't you give us an abstract of it?

Mr. AUTEN. In some respects it has been largely covered by what has been given in figures. In the first place, I believe the question of the amount of commerce not only available if transportation is restored on the river has been established here, but the fact has been established that that transportation is available now whenever that river is improved. The question has been asked "Why don't you put it on the river several months in the year if that is true?" It so happens that we are in a position to answer that question. I have been president of the Little Rock Packet Co. for a number of years. We put two boats on the river. We have the two boats now. The river did not permit of its being navigated. Here is our experience: I would go to the jobbers and say, "Here are two boats. Will you give us business?" "Yes; we will have it in 90 days at Memphis. Can you haul it?" I would say, "I don't know. We can't say. Perhaps next week will see a sand bar in the way." They say, "Then you can't haul it." I am here to say to you gentlemen that improvement must come first. Our boats were tied up some time ago at a high stage of the river with dredge boats almost in sight of them, and that thing may occur week after week, and we can't get contracts from shippers unless we can deliver the goods, if you will permit me that slang expression. They couldn't trust their freight to us, therefore we went out of business. They said, "Whenever you can tell us you can haul the freight we will give you the contracts, but we can't trust you with it until we know you can do it."

It has been our intention to touch only the commercial side of this question. The engineering of it is up to you gentlemen. You are a board of experts. The United States Government has placed you in this position because you are experts. Your long experience enables you to say with definiteness the things that we could only guess at. We do believe, however, that American ingenuity is as great as any other ingenuity. I have traveled Europe over time after time and have seen them running boats on little streams not nearly as big as we have here. I don't know whether it's dikes or jetties, but I am persuaded and

do believe that American ingenuity will enable you to say where it shall be revetted and at what point it will be dredged. I think this board will be able to say when and how this work shall be done. Another thing I am not in favor of and I am persuaded you are not in favor of, and that is any hand-to-mouth methods. We don't want to waste the Government's money. We don't want to put anything in to-day and have it swept away to-morrow. We believe a system should be adopted for improving the channel of this river which, when carried out, will reduce the cost to the least possible minimum of expense. That is our contention. That is our idea. We are not asking you gentlemen to throw away any money, but we have here a proposition that is so vast, that is of such importance to the Southwest that we are intensely in earnest, and we are glad you have come here, and you have been exceedingly patient in listening to this. Of course, we have put in much extraneous matter, because we didn't know how to get in some things without putting in others. We are coming to you and asking you to help solve this question. It is a serious question to us, and it is going to be a serious question for generations to come unless this board gets down to a survey and makes a plan by which appropriations may be made over a term of years which shall improve this channel and give us the transportation for this low class of freight which we are so richly endowed with and which the railroads can not afford to handle for us on account of the cheap rates. I don't know, gentlemen, as it makes so much difference—let me say that accurately—I don't know as it makes so much difference what the cost of this improvement is. The United States Government has demonstrated the fact that it isn't so very careful if it gets returns for its money. In other words, a million-dollar investment that brings back a good return is a good thing, but a fifty-million-dollar investment is just as good if it brings back adequate returns. Our country in the last Congress voted—I forget how much—\$35,000,000 to build a little railroad up in Alaska that is frozen up a part of the year, that has got a few scattered Indian villages but practically no commerce to-day.

That demonstrates the fact that the United States Government is not looking for present commerce, but they are looking into the fields that may develop in the interest of this great Nation. We have resources in this valley as great as they will ever produce in Alaska, and I am here to say to you gentlemen that this is a business proposition; that if it costs \$25,000,000 to work out this channel, which can be maintained at a small cost, it will be a better investment. My friend, Senator Robinson here, voted for that Alaskan appropriation, and I believe it is a good thing. Our Government is growing greater and larger every year, and \$10,000,000 or \$25,000,000—whatever it may be—if we are getting a good bargain for the Government, we shouldn't hesitate about that. The question is, shall we get honest work? The question for you gentlemen to work out is, how shall it be done? We ask you in the name of four millions of people settled in these two States, who have been struggling for two generations to develop these States, we ask you in the name of the children who have been living wretchedly poor and whose children will live wretchedly poor unless they get this, we ask you to work it out for us so that there may be opened up to us a proper outlet for our resources.

I want to thank you gentlemen for your patience. We want to thank you for coming to Arkansas. You heard of Arkansas before you came. Our friend, Opie Read, wrote about it. I came to this State from Michigan. The men of Arkansas came from almost everywhere. Our children are born and reared here. Arkansas is a serious proposition, and no joke. Oklahoma is a serious proposition.

Senator Robinson is with us. We still have 15 or 20 minutes. I want to ask the Senator to say a word to us. I thank you again.

Senator JOE T. ROBINSON. Mr. Chairman and Gentlemen of the Board of Engineers: I should have been very glad indeed to have submitted this case without any statement upon my own part for two reasons: First, the case has been fully discussed, and detailed statements have been made by gentlemen who are familiar with the facts and circumstances surrounding it; and, second, I desire that you shall have an opportunity of meeting other engagements which I know are imperative upon you. For that reason, the last reason, I am going to make my remarks very brief.

It seems to me that this subject, boiled down, involves two big questions. One of them is a peculiarly technical question in some of its aspects; and, as has been stated by Mr. Auten, laymen—persons who are not professional engineers—are perhaps not highly qualified to speak on that question. These two questions

are, first, is the improvement of the Arkansas River for navigation purposes feasible; and, second, will it be availed of for commercial purposes to a considerable extent?

Now, the first question has new light reflected upon it by reason of the fact that new means or devices in the way of improved boats are being constructed and used which do not require the depth of channel which the large boats formerly used did require, and I apprehend that for present purposes a channel in the Arkansas River of the depth of 4 feet would in all probability be adequate to carry the commerce that would be tendered for some time; and, in determining this question, this board of expert engineers, I think, will take into consideration that fact along with the further fact that gentlemen of equal eminence and patriotism have heretofore considered the subject, and even under the great difficulties that confronted them then they have found that the improvement of the Arkansas River for navigation purposes is feasible.

As to the amount of money that would be required to be expended before this project is to be completed, I do not think that even the profoundest expert or the most skillful one could tell that with absolute accuracy, but suffice it to say, that I know that the Federal Congress is not going to appropriate at any one time \$5,000,000, \$10,000,000, or \$20,000,000 for a project of this character without a definite program of improvement extending over a term of years.

Upon the second proposition I maintain that in a trial in any court where the burden is upon the plaintiff to establish by a preponderance of the evidence the contention of his complaint that those who are interested in this hearing have established by a fair preponderance of the evidence, and almost conclusively, indeed, the fact that if this river is available for navigation purposes an enormous amount of commerce will be carried on upon it. This city of Little Rock, through its business men, who are in a sense responsible, has pledged approximately 500,000 tons per annum, and two other cities, Pine Bluff and Dardanelle alone, and the localities surrounding them would raise that to 750,000 tons per annum; and that is not taking into consideration the enormous quantity which would come from other communities of the so-called low-grade freights and products.

The people of the State of Arkansas, under the circumstances that have existed for many years and as they still exist, believe that the improvement of the Arkansas River is necessary to the proper growth and development of their industries and to the development of the enormous resources of which the world knows so little, but which the most ignorant can not remain totally unconscious of if he visits the State. Handicapped as this State has been during the past for want of adequate transportation facilities, we have not developed as rapidly as we should have developed—nothing like as rapidly as the State is capable of progressing, and if this improvement is made, not only the State of Arkansas but the sister State of Oklahoma and other adjoining communities will come forward, we believe, and the wisdom of the investment on the part of the Federal Government will be amply and fully demonstrated.

Now, gentlemen, I could go into a somewhat more detailed discussion of this matter, and if I had the time to do so I might undertake it, but you are trained in the study of these things. The weight of the evidence I say—and this evidence is just as conclusive as it can be without bringing the actual contracts for the freight and laying them at your feet—the weight of the evidence shows conclusively that if the river is opened to navigation it will be used for the transportation of an enormous amount of freight, perhaps more than 1,000,000 tons per annum, and that is sufficient, in my judgment, to justify the expenditure upon the part of the Federal Government that will be required to carry forward this improvement.

I hope and I know that this case is not in the attitude of one that went to the old judge up in Missouri a few years ago, an old justice of the peace, who said he would take the case under advisement until the next Saturday morning at 10 o'clock, when he would promptly decide against the plaintiff.

I feel that there are interests involved in this hearing that mean a great deal for the progress and prosperity and the happiness of the people of this State. We feel that we are not only an integral part of this great Union but that we are entitled to equal advantages and opportunities for advancement with other States of this Union, and we feel that if the Arkansas River, with the commerce that lies about it and is available for transportation upon it, were in other sections of this Union there would be little question about its future and rapid improvement; and we hope, gentlemen, that when you have considered this

case you will find it consistent with the discharge of your duties to continue this improvement upon a substantial basis. I thank you.

Mr. AUTEN. I believe that concludes our hearing, gentlemen.

Col. BLACK. If you have anything more to present we want you to present it.

Mr. AUTEN. Nothing, I think. It is now six minutes until 4 o'clock.

Col. BLACK. We will be glad to receive any further communications.

Mr. BAER. A lot of new matter has come in to-day that I haven't in a form to submit at this time.

Col. BLACK. How long would you want?

Mr. BAER. Say 15 days.

Col. BLACK. That will be granted. If there is no further evidence before us the meeting is now adjourned.



